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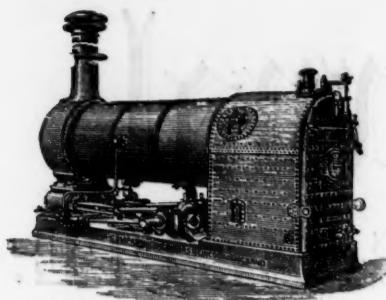
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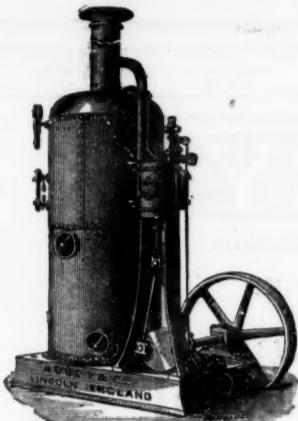
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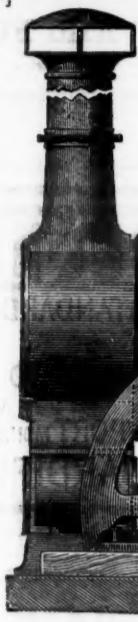
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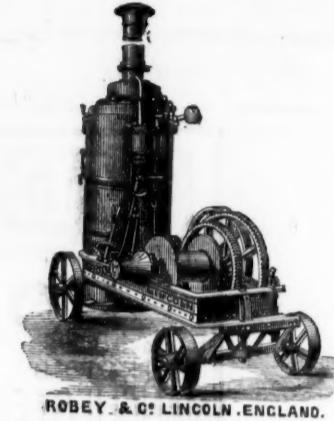
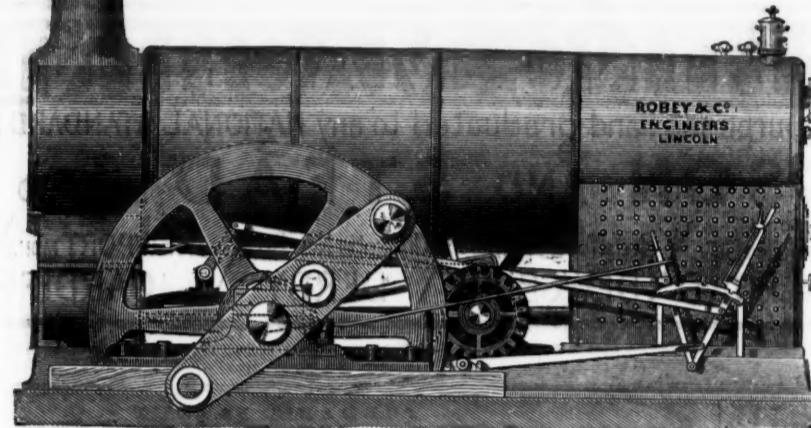


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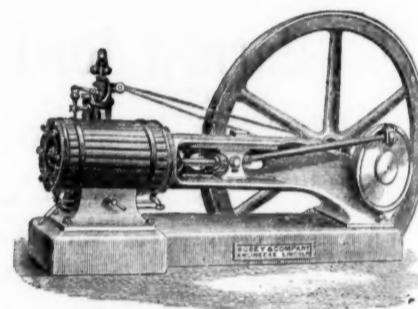


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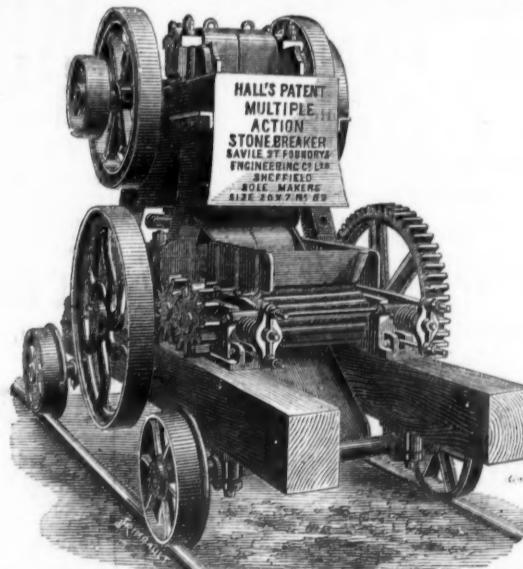
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Original Correspondence.

THE FISSURE THEORY OF LODES.

SIR.—It is generally supposed that Abraham Gottlob Werner was the first to point out in his "Theory of the Formation of Veins" that true lodes had once been fissures, but Professor Smyth, in his "Lectures on Mining," delivered in 1875-6, shows that Dr. Pryce of Redruth, the author of the famous "Mineralogia Cornubiensis," saw very clearly that various lodes had been filled in by various minerals.* I shall now endeavour to show that Dr. John Woodward, no mean geologist, although a bad theorist, stated lodes to be "perpendicular fissures sixty years before Werner was born—i.e., 1750, and 83 years before the "Mineralogia Cornubiensis" was published—i.e., 1778—Part IV. of Woodward's "Natural History of the Earth," first published in 1695, is devoted to the "Origin and Formation of Metals and Minerals." He there says that metals and minerals are enclosed in strata or contained in their perpendicular fissures.† He divides the contents into those which are a rude heap, without any particular form or order, being only included between the two opposite walls or side of the said intervals which they—for instance spar and the common ores of lead, tin, and iron—wholly or partly fill, and those which are of some observable figure—i.e., those which are crystallised, or as Woodward terms it, shot into crystals, and those which are sub-crystallised.‡ According to this author all stratified deposits were formed during and on account of the Noachian deluge, those minerals found in lodes being deposited gradually after that event, and formed almost of course merely by the ordinary motion of the water, and its passage to and fro in the earth.§ Further on he states that the deposits on the sides of lodes almost invariably take place by water leaving them behind,|| and that such deposits may and do grow, and have grown since the deluge.¶

It is clear, then, from the above quotations, that Woodward—(1), regarded lodes as being nothing more or less than fissures; and (2), believed that their contents were introduced by the agency of water. He uses the term perpendicular intervals synonymously with that of perpendicular fissures.** His idea evidently was that where lodes occur there was once a breach in the continuity of the strata; in fact, that the strata were deposited in a manner that we may compare to a row of books parallel to each other, but not in contact, the space between each forming a perpendicular fissure. Although his view of the way in which these fissures were formed, and of the mode in which they were subsequently filled, is entirely erroneous, yet the two statements numbered above stand out in bold relief, and are alone sufficient to invest Woodward's name with fame.

Woodward was a practical observer—a rarity in his age—but his mind was unhinged by the idea that all geological changes were brought about by the deluge, consequently he failed to form any rational generalities from his observations. Every effect he witnessed, whether it was the presence of fossil shells in mountain summits, great thickness of stratified deposits, or mineral deposits in lodes, he imagined was produced by one great cause—the universal deluge. By observing the structure and contents of rocks at home, and by encouraging similar observations abroad, he indirectly added to the then new-born science of geology, but whatever addition he made was certainly neutralised in a great measure by his strange theory. If Woodward had started in his studies with no theory at all, and with a mind totally unbiased, then he could not but have formed very sound conclusions, but having the vision of the flood continually floating before his mind, the result was directly otherwise.

It is strange that in his days when Lord Bacon's practical and experimental method of tracing effects to causes had only just commenced to win votaries, all great men of thought and reading conceived bold theories of the earth, and suffered their conceptions to be printed and published, and thus made eternal shipwreck of their reputations. In these latter days of unadorned and calm reasoning men tremble at the idea of producing a theory of the earth from the epoch when it was chaos to the epoch when it shall be chaos again; or in other words, when it shall burn away to ashes.

EDWARD HALSE, Assoc. R.S.M.

CENTRAL RAILROAD COMPANY OF NEW JERSEY—
SEVEN PER CENT. INCOME BONDS.

SIR.—Although the earnings of this company have not been made public, it is reckoned that upwards of \$4,250,000 net profit will be the result of 1880. Out of this the mortgage bonds will require \$1,750,000, leaving \$2,500,000 as surplus for the Seven per Cent. Income Bonds and ordinary shares. The interest on the Seven per Cent. Income Bonds may be said to be assured, as the annual charge thereon is only \$171,500, or 34,300*l.* After the Seven per Cent. Income Bonds are \$20,600,000 in shares, which are quoted 75 to 80. Taking these facts into consideration, the Seven per Cent. Income Bonds are intrinsically worth 100, and will, no doubt, advance to those figures as soon as the merits of them are better known.

London, May 6.

B. E.

MINING IN BRAZIL—THE MINAS GERAES DISTRICT.

SIR.—There appears to be some attention turning towards this mining province, and as so little is known of it in England you may think an occasional letter worth placing before your readers. Those persons who are at all acquainted with this country know that aside from the gravel mining, which has been pretty well exhausted by Brazilians, scarcely anything has been done here. The immense quartz lodes, with which the province abounds, and the softer jacutinga and itacolomite deposits are but little prospected.

The St. John del Rey, the North Pedro del Rey, and a few lesser lights, point out the way, but so far the followers are few.

It is safe to say that speculation in London has been the ruin of nearly all the mining undertakings which were presented from this province. Without a liberal provision for working capital it is worse than useless to buy mining property. Labour is cheap enough, but transportation is slow, and timber of all kinds costly, and not easily procured. The work of preparation is tedious and expensive, but the inducements this country offers are far greater than can be found on the Pacific Coast of the United States.

A property called the Mount Gloria, and one near by, the Assis Faria, have been "looked at," with a view to place on the London market, as we are told. Both properties are worth the attention of capitalists who will subscribe sufficient money—first to open the mines, and then to furnish them with water-power. No trifling job, but an indispensable one, if real business is intended. These properties are near the St. John del Rey, and are well worth exploring; after which the cost to work them can be known.

The Assis-Faria shows a large chimney of fine ore: 200 ft. deeper will prove it a mine, or expose its faults. Then water, costing from 20,000*l.* to 25,000*l.* to bring to the mine, and as much more for permanent works must be provided.

A Mr. Mills reported on a gravel mining property situated at Sao Cyriaco in this province. Strange to say it was sold in America, although I believe Londoners had the first chance to buy it. Some Bostonians purchased it on the representation that it would yield a profit of \$2,214,201,000 from the gravel alone, with three years work, besides sundry large sums from shales, &c. He was employed by the purchasers to take charge of the works, on account of his knowledge of these deposits, and his experience. * * * This affair, however, widely known in New York and Boston, has had the effect of keeping American capital away from Brazil, mad as they are on the subject of the resources of Brazil and on mining. * * *

It is safe, however, to say that the opportunities for engaging in legitimate mining are very great here, and the price of property is not inflated, as is the case all over the mining region of the States.

The decline of the St. John del Rey shares need not frighten capital away from Brazil. The company have had a long and prosperous career, and the shareholders have received enormous dividends. They

* See Lecture III. in *Mining Journal* for those years.

† An Essay Towards a Natural History of the Earth and Terrestrial Bodies, especially Minerals." Second edition. 1702, p. 169.

‡ Op. cit., p. 177.

§ Page 179.

|| Page 189.

¶ Page 194.

** The Latin word *fissura*, besides signifying a rift or cleft, means a gap, and also denotes the divisions between the fingers and toes.

have plenty of new ground to prospect, and there is still a large quantity of second class ore in sight. When the section of the Don Pedro Segundo Railway, now under contract, is completed the heart of the mining region of Minas Geraes can be reached by 75 to 100 miles inland travel, and the country now known to but few Englishmen will certainly attract much attention.

Again, let me say to those persons who would make a venture here provide plenty of working capital. JOSEPH R. PARTRIDGE.
Minas Geraes, March 29.

THE BRAZILIAN GOLD MINES (LIMITED).

SIR.—Your correspondent, "B. H.," in last week's *Journal*, says that this property "is likely to ensure a great and permanent success." That it has been "honestly brought before the public," as stated by "B. H." the position of the directors guarantees, and that they believe in the "great and permanent success" of the mines may, I think, be taken for granted, as I understand each director is a large shareholder, having with his friends subscribed a large proportion of the capital.

My reason, however, in troubling you, Sir, is to elicit from your correspondent information about our property more than communicated in the official reports. I understand from a brother shareholder that previous to Mr. Richards' departure from England to take the management of the successful Santa Barbara Mines, some few gentlemen, shareholders, I presume, in the Brazilian Gold Mines (Limited), met that gentleman, who afforded many valuable and exclusive facts. If "B. H." attended this meeting and would through your columns communicate what took place, I am sure he would greatly oblige the large body of shareholders who were not present.—May 5.

A SHAREHOLDER.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR.—Having become aware of the particulars of a new company put forth by Mr. Pearson, I would just point out that his or anyone else's title will be found to be very defective unless the interests of the present share and debenture holders are properly cared for. Mr. Pearson has announced that he has completed a contract for the transfer of such rights as he can pass respecting the title of the property, but as the principal signature to such contract is wanting, the whole affair must pass for what it is worth. There seems no doubt, however, that this contract was concocted on or about Friday last for the purpose of bearing the shares. It is well known that Mr. Pearson has been authorised for the past year by Mr. Billing to negotiate for the purchase of such rights as he (Mr. Billing) has, but up to the present time all of his efforts to raise money have been abortive and fruitless. But even suppose he were to succeed, he would be landed immediately in a personal lawsuit, as well as a sea of litigation, on behalf of the title, as no legitimate or valid title can be obtained or held except by the concurrence of the present company, and I beg my fellow-shareholders to bear this constantly in mind and act accordingly. Probably after this explanation the proposed new company will not court lawsuits and litigation. No new company can be successfully launched or possibly succeed without the complete and satisfactory endorsement of the share and debenture holders of the present company; therefore, the present shares may be looked upon as having a very decided value—I think at least double their present market price. Mr. Pearson admits the great value of the mine; then why does he now propose, wholly ignoring those who paid the large sum of 300,000*l.* originally for it, and who have during the past eight years advanced many additional thousands on debentures for keeping the company alive and carrying it on? Neither share or debenture holders must be ignored, but on the contrary liberally cared for in the formation of any new company, or otherwise a stormy career is in store for the new organisation. In conclusion I much regret to hear of the conduct of Mr. A. A. de Metz, our secretary, and if I were a director I would see that he left the company's employment at once. A LARGE SHAREHOLDER.

May 7.

THE FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR.—As a large shareholder in the above company I shall thank all share and debenture holders to co-operate with me, and thus prevent their property from being sacrificed by interested parties who are presuming to bring out a company, entirely ignoring our position as shareholders and debenture-holders. The only syndicate in existence is that projected by Professor Vincent, which is now all but completed, and if the ill-feeling existing between some two or three interested parties were brought to an end (which there seems to be much hope for), I see no reason why the syndicate should not at once be closed and result in great success to both share and debenture holders, as in the syndicate scheme alluded to their interests will be recognised. Various unfounded rumours, including one of a fresh lawsuit against the company, are without foundation, and are evidently circulated with no other intention than that of depreciating the market price of the shares. As a holder of so large a number of shares myself, and also acting on behalf of various other large holders, I feel I am justified in taking upon myself the prominent position here assumed. Shareholders and debenture holders are respectfully requested to communicate with the undersigned. All communications will receive prompt attention. T. J. BUSE.

Arundel-street, May 5.

P.S.—Since writing the above I have had placed in my hands copy of a circular issued by Mr. A. A. de Metz, the secretary of the Flagstaff Silver Mining Company of Utah (Limited). Inasmuch as this circular has been issued without the consent of the directors, and shareholders as well, I consider he, as secretary, should be censured severely by all concerned for having taken upon himself such a piece of presumption. Mr. A. A. de Metz is now upholding a scheme which distinctly told me little time back was impracticable and unacceptable, the only one he had faith in being that projected by Prof. Vincent as fair and equitable both to the share and debenture holders.

From the concluding part of the circular in question, it appears that Mr. A. A. de Metz intends accepting the post of secretary of the new company, which is no doubt an inducement to him for altering his opinion. In this so-called new company, which is propagated by Mr. Pearson, the well-known opponent of the present company, it is intended to completely ignore the interests of both share and debenture holders (notwithstanding that Mr. Pearson, no longer than three weeks since, as appeared in your *Journal*, propounded a scheme which did in some degree provide for both share and debenture holders). This must be strenuously opposed by all having the least regard for their own welfare.

Mr. de Metz's circular commences with a remarkable phrase, "Before severing my connection with the present company," &c.; and I would only remark that if Mr. de Metz is capable of such conduct before leaving his present situation, or giving his superiors any intimation of his intention so to do, what may those in authority in the new company expect probably "Before severing his connection with that company?"

T. J. B.

PITANGUI GOLD MINE, BRAZIL.

SIR.—By the last advices from the mine, dated March 31, the manager stated that a commencement of the treatment of the mineral would be made in a few days. As it is a month since the dispatch of his letter we may expect any day to hear they have taken out large quantities of gold; they would have done so before, but when the largest quantities of gold were discovered they at once commenced to erect a wash-house, and by this report it appears it is almost completed. Let me add that in December the Ouro Podre lode was discovered, and found very rich, and also shoots apparently having no connection with the former and 4*t* tons treated as a test produced 133 ozs. of gold, or an average of 28 ozs. per ton. The chances are all very favourable that this mine will soon rank as one of the foremost jactatinga mines in Brazil. The Gongos Soco, like the Pitangui, produced upwards of 1,432,170*l.* worth of gold, and the Maquiné Mine yielded in three years a profit of over 140,000*l.* The shareholders must have patience, and in a very short time they may expect to be pleasantly astonished with the results from Pitangui. It is only lately the shares have crept into the market. I may say the

present price of 2*t*. to 3*t*. offers a desirable chance to obtain good profits.—London, May 7.

B. H.

RICHMOND MINING COMPANY.

SIR.—A word to shareholders. Let no interested adviser induce you, in any circumstances, to part with your shares. The mine today is an astounding prize—its shares are worth, as an investment, at least 20*t*. per share. Developments point to even far greater riches. Increased dividends and bonuses must be paid, and the shares advance in price more than 50 per cent. above present quotations.

May 7.

ONE BEHIND THE SCENES.

BRITISH MACHINERY AT FOREIGN MINES.

SIR.—During the past few years the complaints of ill-constructed machinery and worthless material have become so frequent in connection with engines, &c., of British manufacture, and American machinery is so largely replacing English, not only in the New World but in the Old, that I may be permitted to ask whether the engine referred to by Mr. J. A. Maughan, of the Nerubudda Company's mines, as badly finished and always leaking at the tubes is of British or foreign manufacture, and whether it is by a recognised maker?

ENQUIRER.

WEST OF ENGLAND IRON ORE COMPANY (LIMITED).

SIR.—I find that this company has been registered according to Act of Parliament, for purchasing and working the iron and manganese lodes in Retew, in the parish of St. Endor, Cornwall, and such other iron mines as the company may acquire under the Articles of Association. The vendors charge no money consideration for the property, but they take a certain number of fully paid-up shares in lieu thereof. The sett has a length on the chief lode—which is from 10 to 12 ft. wide—of nearly $\frac{1}{2}$ mile. By driving an adit from the Cornwall Minerals Railway to that lode the produce can be conveyed over a tramway having a gentle inclination direct to the railway trucks, and dispatched to Newquay for shipment, thus saving all cartage, mechanical force, and pumping expenses. The adit will take the lode at 24 fms. from surface.

The agents expect to be able, when the adit is completed, to send away 100 tons per day, and after awhile considerably more, at a cost of about 6*s*. 3*d*. per ton. Assuming the output to be only 50 tons per day, and the price for delivery, f.o.b., to be 10*s*. per ton, there would be a profit of 23*s* 4*d*. per annum, which would give a dividend of 30 per cent. per annum on the present issue of shares when fully paid. The ore is red hematite, and contains a large percentage of metallic iron and manganese. Dr. Norman Tate, of Liverpool, gives the result of his analysis—"Peroxide of iron 65·28, and peroxide of manganese 15·95." Mr. J. H. Collins, county analyst, Truro, analysed a large sample with this result—"Peroxide of iron, 81 percent.; oxide of manganese, 5·44." He says—"I consider it one of the best hematites which I have ever analysed." I understand that orders are on hand, and in course of negotiation, for over 10,000 tons, at prices varying from 12*s*. 6*d*. to 16*s*. per ton, f.o.b.

Iron mines are more free from risks than those of tin, copper, and lead, and are more cheaply worked. I am informed that most of the shares (3000 at 5*t*. each) are already placed. The secretary is Mr. G. K. North; offices 44, Queen-street, Wolverhampton. The working of this mine and a few other (tin) mines in the same district has excited considerable attention, being the means of affording employment to a large number of labourers.

R. SYMONS.

BRITISH SILVER-LEAD MINES.

SIR.—I have great pleasure in calling the attention of capitalists and investors to this highly mineralised property, situated near Blaenau Festiniog station, from whence a railway passes close to the dressing-floors, thus affording every facility for inspection, and conveyance of ores from and materials to the mines. I have carefully examined the sett, which is extensive, and traversed throughout by champion lodes, embedded in one of the most productive stratifications known. The workings on the south lode have developed a rich course of ore in the eastern shaft, and the level going west is in a large body of ore, rich in silver, and proved to exist for several hundred yards further west by trial-pits. The north lode is yet in its virgin state; but as the congenital stratum crosses the lodes, it is only fair to assume it will be as productive as the south or parallel lode. The lead ore, which is rich in silver, will command a high price, and with an output of only 100 tons per month is estimated to yield a dividend of 25 per cent. per annum. As a permanent and remunerative investment, its equal is seldom to be met with, and I shall be happy to supply any further information required.

JOHN L. M. FRASER,

Greenfield House, Wrexham. Consulting Mining Engineer.

ALL ABOUT TIN.

SIR.—In one of my letters in the early part of this year I warned the tin mining community against inflated prices, and against expecting such a rise in the price of this metal as had just then been predicted by one of the tin smelters. My correspondence from Tasmania and Australia had fully indicated a drop below the prices then prevailing, and enabled me to advise my friends accordingly. Events have since proved which was right. I do not intend writing a long letter at present on this subject, but think it is quite time to offer a word of caution to the unwary against investing capital in the whirlpool of deep, watery, and to a great extent exhausted mines. Some of these are now being commenced with water enough in them to float Her Majesty's Navy, and to drown all the capital which can be brought to bear upon them, while there is plenty of good productive mining ground unexplored, and comparatively unnoticed, which will return in a short time ten times the outlay.

W. TREGAY.

UNDERLIE OF LADDERS.

SIR.—Although I do not for one moment doubt the desirability of the proposed Special Rules for Metalliferous Mines, but it is very evident from reading only one of the provisions—that "when reasonably practicable no ladder permanently used for ascent and descent shall be fixed with an underlie of less than 1 ft. in a fathom." There may be a necessity for a rule on the subject, but it certainly cannot stand in its present form. To climb on an absolutely straight ladder is unquestionably fatiguing, but I think most miners will agree with me that to set a ladder with an underlie of 1 in 6 will with many of the ladders in use form a very uncomfortable and dangerous roadway. The fact must not be lost sight of that the stiffness of a ladder depends on the angle at which it is placed, and although the difference is not noticed in a short unfixed ladder, which must indeed be necessarily placed at a comparatively great angle to secure stability, but even a 30-ft. ladder standing with the foot 5 ft. from the vertical will sway considerably more than if placed 4 ft. 6 in., and at 4 ft. it is comfortably stiff. When but 30 ft. has to be climbed it matters not whether the underlie be 5 ft. or 4 ft., but in climbing from the bottom of a deep mine it is essential that the maximum of stiffness should be secured, for a man is more likely to fall out of a ladder which dances than out of one that is firm.

Nor is this all. A ladder which is of ample strength when set at 9 in. in a fathom underlie might be of insufficient strength when set at 1 ft. in the fathom, for although rung is as liable to break in one case as in the other the strain on the sides of the ladder increases with the angle or underlie. Now, it was ascertained after much experience that miners could climb better on ladders made with the rungs 11 in. from centre to centre than on those with any other depth of tread, and it should be ascertained in the same way the precise angle or underlie at which the minimum of strain with absence of inconvenience to miners on the average can be obtained, and this underlie should be as uniformly used as the 11-in. tread. To some the expression "miners on

and size of miners I think we shall find that the underlie for ladder to secure minimum strain combined with safety (which I assume to be attained when the climber's centre of gravity falls at any point nearer to the rung on which he is placing his foot than to the rung on which the motionless foot stands) will be between 9 and 10 in. The problem can readily be worked out mathematically; but, knowing that it is impracticable to insert formulæ in a newspaper, I content myself with directing attention to the subject in a way that I hope it may be practically discussed by practical men. —**ENGINEER.**

May 6.

LEAD MINE PROSPECTS IN LLANARMON.

SIR.—I have been favoured with the perusal of a few reports on the above subject, and I present them to your readers, in the hope that they will be a means of directing attention to the district of Llanarmon as a field for lead mining. I am precluded from mentioning the names of the writers, but I can vouch for the genuineness of the reports. I will only give you two extracts this week, but will, with your permission, continue them at some future time. The author writes from the Lady Ann Lead Mine, Nant-y-Palme, April 22: "I am glad to say the level is progressing well, and the vein improving in appearance. The hanging side has a rib of beautiful vein stuff 6 in. wide, tinged with gossan, the other branch being 3 in. wide. My faith is growing with the progress, and ultimately I have no fear of the enterprising spirit displayed being crowned with success. We see the beginning or a strong built nest for the young bird left up aloft (in the shaft), to grow and strengthen and flourish. I hope you will be pleased as I am with improving appearances." Again, on May 1, he says—"The men will have finished their bargain to-day. There is no new feature in driving the 30 yard level east at Lady Ann, except that the span in the 'hanging' is now about 9 in. wide. It presents exactly the same promising appearances as when I last wrote."

The above property is a private company, and being intelligently worked. From information I have on other properties, and what is taking place in connection with them, I expect your readers will shortly be startled with the announcement of the inauguration of the largest and most powerful limited company for miles around this district, to work properties that are known to teem with untold quantities of lead ore.—**May 4.**

—**ENQUIRER.**

LEAD MINING IN LLANARMON.

SIR.—In the Journal of last Saturday week I asked if any of your readers could give me any information about the Westminster United Lead Mining Company upon certain points named. I did not see any answer in last Saturday's Journal, but I have information from another quarter upon all the subjects, and I find it will very likely before long be brought to the front as a very important company, and I, therefore, refrain from saying anything further for the present, excepting that I am regularly receiving reports of lead mining in this neighbourhood, and everything going on at present betokens activity and prospects of success, and important announcements will most likely be made before many weeks are over. To gentlemen visiting this district to make enquiries about the various properties situated in it, and who may, in the first instance, not feel disposed to engage or pay for professional services, I would here make a suggestion that they should give a call at the Cross Guns or Cross Keys Inn, at Erryrys. They will find the landlord well versed in mining matters in the district, and communicative. An hour so spent may be the means of great good to the intending investor and adventurer in more ways than one. It is what the writer has done himself, and he has every reason to be satisfied with the information so obtained, and he is desirous that everyone seeking investments should obtain all the information that it is possible to have.

May 5.

THE LLANRWST MINE, AND ITS MANAGEMENT.

SIR.—The letter of "A Country Shareholder," published in the Supplement to last week's Journal, reflecting on the management of this mine is entitled—notwithstanding its being couched in ambiguous terms—to some sort of a reply; and, as I am personally referred to therein in no very complimentary terms, a few lines from me may not unreasonably be expected. To begin with, I was not aware of being discourteous to Colonel Roden or any other gentleman at the meeting, but mere discourtesy is less than I am charged with. Ordinary English it appears failed my accuser to provide himself with term sufficiently expressive of his disapprobation of my behaviour on that occasion, and hence the slang term "cheeky" is had recourse to. It is strange that I should have been and remain unconscious of such reprehensible demeanour if it had occurred. No one reminded me then or subsequently that anything of the kind had taken place, nor do I think had such a thing happened that Colonel Roden would have failed to notice and take exception to it.

It borders on the verge of absurdity to affirm that I evaded the question asked of me, as the first sentence I uttered in reply was that I anticipated it in my report, and answered it; but I did not make that fact and statement an excuse for not answering it again at the meeting. I did answer it as readily as possible, and with as much candour and explicitness as I could command, and also explained why it was that the requisite funds could not be made available from the ore in reserve at the present time—that such an attempt would result in a sacrifice from an increase of expenditure, which would render their otherwise profitable extraction profitless. "A Country Shareholder's" indictment of the management of the management of the mine in general terms is the ambiguity I have referred to. I am at a loss to decide whether it is the London or local management which is intended, or whether both are included in this condemnation, and, therefore, my remarks will have reference to both, beginning, of course, with myself. It is equally irrational as it is ungracious to prefer a charge of this sort against me unless it rested on an express and explicit foundation, and that I know does not exist. It is the first thing of the kind that has ever happened to me, whilst at no period of my life was it so little expected as in this connection. I have brought to bear on the affairs of this mine in all its practical relations the most matured experience I ever possessed the acquisition of more than a generation of time, together with the concentration of a devoted energy and attention surpassing anything and everything to which I had previously committed myself in the prosecution of mining.

It is highly satisfactory to be able to state thus publicly, on taking a cursory retrospect of my past official life, that the fortune of no mine of which I was the manager was ever retrieved by its transference to another; and the Llanrwst Lead Mine is not diseased or weakened by the regime to which it has been subjected, as the treatment it has received wonderfully agreed with its health and constitution, especially the deeper probing experiments, whilst up to the present its only symptom of languishing is from the want of deeper and more protracted incisions. It is not an antiquated concern on which abuses have from time to time insidiously engrained themselves, and have thus imperceptibly incorporated with itself the deleterious constituents of a corrupt system, to eliminate which the most drastic measures would have to be resorted to. Nothing of the sort is here; the mine stands out in bold and beautiful outline, the wonder of some in its symmetrical equipments, the envy of others, and the admiration of all—unsurpassed as it is in its general and critical arrangements at the surface, and comprehensively outlined subterranean developments and discoveries. It is in view of this that the question recurs—Why do you not take out a few thousands from the reserves of ore in sight, and conduct your operations independently of external support? If the thousands in reserve were in the shape of specie it might soon and easily be done; but the ore is in the solid rock, and can only be got loose by judicious and systematic proceedings, which necessarily limits the extent of operations with a view to the most profitable issue. So much for the local management and the mine.

As to the London management, it has I believe done the best it could for all parties concerned under the circumstances. If there were not funds on hand it could not be expected to coin them. There has been a stringency of means for the proper and vigorous development of the mine from the commencement, which the London stockbroker your correspondent refers to, and others of the same type, may have had a great deal to do in producing. This is but a

surmise, which may be true or not, but of this I am certain, I have never previously witnessed so determined, persistent, dire, and senseless antagonism to a good mine, for a good mine it is, and as far as it has yet been opened is an eminent success. We have failed of nothing except the means of its more rapid and extensive development. It is well known to you, Sir, and many others, that it has had to fight for a recognised existence almost from the first hour of its inception to the present time, and what but an inherently good mine could have survived such an environment; but it still lives, and will live, and live and flourish prosperously—in all probability—long after its most virulent assailants and detractors shall have been relegated to the dust or to the dogs. It would be a novel idea in any other pursuit but that of mining to impugn the management for not doing that which it never had the means of accomplishing. "A Country Shareholder" has had recourse to a very feeble comparison in respect of the preservation of life. It is quite conceivable that the excision of human eyes may be the means of prolonging the life of an individual, but who ever heard that the picking out of the eyes of a mine was, or possibly could be, conducive to its longevity. The loss of one's eyes would indeed be a most deplorable catastrophe, but the loss of reason and intellectual control is to an individual a more calamitous, lamentable, and universally deprecated occurrence.

Llanrwst Mine, May 5.

ROBERT KNAPP.

GWERN-Y-MYNYDD SILVER-LEAD MINE.

SIR.—The report of this mine, published in last week's Journal, must have rejoiced the hearts of investors in mines. The Gwern-y-Mynydd is no ordinary mine—if I term it the future Richmond of Wales I think I shall not be far wrong. The direction is exceptionally good; the preliminary and expensive work of the mine was long ago carried out by a former company, from which I understand this present mine has descended. The published report is no ordinary one, and has, I understand, the full knowledge and sanction of the directors. Apparently the shareholders of this mine will soon realise heavy and regular dividends, as silver ore has already been found and sold in considerable quantities, though the main body of ore has not been reached. The mine is near a railway station, and it is said the shares (4*l.*), though quoted at about 6*l.*, cannot be purchased at that figure, because the holders of shares keep them as a permanent and good investment.

OBSEIVER.

CARN CAMBORNE.

SIR.—I see in your columns of last week a letter respecting this mine, in which the writer seems disposed to discourage the enterprise because he having been a shareholder in the past working says he shared in the loss of 30,000*l.* If this large sum were really expended in addition to the still larger amount derived from the sales of copper and tin, and seeing that the cost of draining the water was remarkably small, whilst the workings have been extended only to a depth of a little more than 100 fms., and horizontally to about the same extent, one cannot help thinking that there must have been a very inefficient and costly system of working pursued, and may, therefore, with the greater confidence, anticipate very different and much more satisfactory results in the future. I do not see that any mining ground in Cornwall occupies a more favourable site, seeing that it is bounded for a considerable distance longitudinally by the richest mine in Cornwall (Dolcoath), and embraces the same formation of granite and clay-slate rocks in which all the enormous quantities of copper and tin which that celebrated old mine has yielded were found, whilst the lodes are parallel, and the cross-courses identical. What more, anyone can ask for a first-class mining enterprise! I am at a loss to conceive unless it should be long courses of copper and tin already laid open, and waiting only to be dug out and sent to the surface. Both these ores will be found available as soon as the workings have been drained and cleared, but the main results must be looked for in opening into the hitherto untried ground which was so strangely and completely neglected in the past, and where by far the best prospects present themselves. I shall be very much mistaken if Carn Camborne does not prove by a small outlay to be one of the best mines of the rich neighbourhood in which it is situated.

A PRESENT ADVENTURER IN CARN CAMBORNE.

CARN CAMBORNE.

SIR.—We noticed in last week's Journal a most puerile attack on the above mine by some person sheltering himself under the soubriquet of "A Late Adventurer." It is to be regretted that attacks Had his name been appended his motive would have been apparent. We have no doubt that it is instigated by personal animus, or perhaps regret, that some other and more plucky adventurers are likely to derive the benefits from vigorously developing this property, the situation of which is without cavil a guarantee of its future success. Your ignoble correspondent does not state for the benefit of your readers that the mine is fully equipped with machinery in going order, all of which has been paid for by its present owners; that it is now nearly in fork, that its quondam adventurers went around the church to find the steeple, or, in other words, drove their levels anywhere but where they were likely to find the lode, much to the advantage of the present purchasers, who otherwise might never have become possessed of the property. We have no doubt the 30,000*l.* spoken of must have been greatly wasted, on the development that should have been made with that sum would have commanded a still better price for the property than that now asked—13,500*l.*, or less than half that purported to have been expended upon it. We caution your readers to regard with an eye of suspicion all correspondence written with a view to damage legitimate undertakings when the authors are ashamed to fatter them.

85, Gracechurch-street, May 4.

ENDEAN AND CO.

CARN CAMBORNE.

SIR.—In last week's Journal "A Late Adventurer in Carn Camborne" appears extremely shocked that this property is being re-worked. As I am, on the other hand, a present adventurer in it I may be allowed to say a few words in its favour. The position of Carn Camborne is second to no mine in Cornwall. It is bounded on the north by Dolcoath and on the south by South Condurrow, with valuable and proved lodes intersecting it; one of these is Dolcoath south lode, and another is the celebrated Druid lode of Carn Brea. The depth of Carn Camborne is but 95 fms., that of Dolcoath 1*1/2* miles, while South Condurrow is considerably deeper than Carn Camborne, but, as the latter is situate on the top of a hill, its extreme depth is only on a par with Dolcoath's adit level. If, therefore, no satisfactory results had been achieved by the former workers of Carn Camborne it could be but little matter for surprise to any person possessing the faintest knowledge of mining and the position of this sett.

In comparison with the surrounding mines the operations hitherto carried on in Carn Camborne amount to little more than mere surface scratching, and, notwithstanding this fact, the mine has returned about 75,000*l.* worth of tin and copper. I consider this a very satisfactory result upon the expenditure of 30,000*l.* It is easy for people like "A Late Adventurer in Carn Camborne" to gratify their personal feelings of animus against individuals by writing letters to the *Mining Journal* with a view to damage the properties in which they know them to be interested. Such cowardly attempts are, however, generally seen through. A man who writes honestly and *bona fide, pro bono publico*, does not shelter himself under a *nom de plume*.

If "A Late Adventurer in Carn Camborne" had been straightforward he would have stated that the whole of the plant, machinery, &c., together with the leases of the mine, were all paid for, and that the 2*l.* 5*s.* per share represents but 13,500*l.* for the whole property as a going concern, in position to return ore to market immediately it is in fork and at full work. He would also have stated that the present adventurers derive the benefit of a large amount of dead work done by former proprietors. He might likewise have gone a little further back in his researches amongst your back numbers, and unearthed a dozen now first-class dividend-paying mines which were abandoned by timorous individuals like himself, and owe their brilliant successes to the pluck and enterprise of those who found the money to re-work them after his prototypes abandoned them.

It is not improbable that had this "Late Adventurer" and his co-adventurers worked the mine properly it would have been still theirs. Fate, however, decreed that they should work it upon a novel and original plan—driving horse-shoe levels away from the lode instead of straight ones into it. The latter mode of working has, fortunately, been reserved for its present owners, and I have not the least doubt that under the able management of Capt. W. C. Vivian, and with a very small expenditure of capital, Carn Camborne will within a reasonable period prove equal in value and productiveness to any mine in the county of Cornwall.

G. S. GREGORY.

[The correspondence on this subject must now cease.]

Meetings of Public Companies.

ROMAN GRAVELS MINING COMPANY.

The tenth ordinary meeting of members was held at the offices, Finsbury Circus, on Wednesday. In the absence through indisposition of Mr. Tufnell Southgate, the Chairman, the chair was occupied by Mr. ROBERT WILSON.

The notice calling the meeting was read by Mr. F. F. WILSON, the secretary, and also the following supplementary report from Capt. Arthur Waters:

May 4.—There is no change of note in the 12*l.* going south of new engine-shaft for the last fortnight. We are now driving on the footwall part of the lode, which is yielding good stones of lead ore, and looks like improving shortly. The 110 north shows a lode 14 in. wide, charged with stones of lead ore and blende. The 110 south is now worth 1*1/2* tons of lead ore per fathom. The 95 south has improved, present value being 2*1/2* tons per fathom. The 85, south of Bettow's winze, is worth 2 tons per fathom. The 65 south, on hanging-wall portion of the lode, is worth 2 tons per fathom. In the cross-cut west going out to prove the footwall part of the vein we have to this date cut into carbonate of lime and lead ore, the value of the latter being 2*1/2* tons per fathom. I expect to find 10 to 12 ft. in width of lode still in front of present cross-cut end, and it will be an exception to the rule if we do not find good ore-stuff on the footwall side of the lode. The stopes in back of this level, 20 to 30 fms. behind said cross-cut, are worth together quite 12 tons per fathom. The other stopes are quite up to the value given in my general report.—ARTHUR WATERS.

The CHAIRMAN said that after the elaborate report from Captain Waters, supplemented by the report which they had just heard, he had little to do except to congratulate them upon the improved prospects of the mine. At this time last year they were selling lead at a very low price. Notwithstanding that they had been able to pay two dividends in the year, and if the accounts were made up to the present time they would stand at 900*l.* better than last year, allowing for the dividend paid to the same date.

Mr. SCHOFIELD: Is that after paying the 5*s.* dividend the other day?

SECRETARY: In the previous year we only paid one dividend now we have paid two dividends, and are 900*l.* better.

Mr. PETER WATSON: Since the accounts were made up there have been sales of ore, which have increased the money, and enabled another dividend to be paid, and it is 900*l.* better now than 12 months ago.

A SHAREHOLDER asked whether it would not be better to bring up the accounts to a date closer to the meeting, or else hold the meeting a little earlier?—The CHAIRMAN said it had always been the practice to make the financial year end on Feb. 28, but he might mention that the last sale of ore was on April 13, and the costs were made up to April 23. After deducting the dividend, and crediting the costs, the amount in hand was 980*l.* He might mention that 200 tons would be sampled next week. There was no mine where the accounts were brought up closer.

A SHAREHOLDER said he thought it would be advisable to state in the account the cost per ton of the ore raised, and the average price received per ton.

Mr. PETER WATSON, Mr. F. R. WILSON, and one or two other gentlemen pointed out that any such returns would be fallacious to a considerable extent, inasmuch as there might be some extraordinary expense, or there might be a good deal of ore broken, the cost of which had been paid, but which had not been realised.

Capt. A. WATERS, in reply to some observations said, that when the company took possession of the mine about 500*l.* would have bought all the machinery, engines, and everything. Since then about 25,000*l.* or 30,000*l.* had been spent on the works, and on new works, all of which had been paid for out of revenue. If all the lead broken in the mine and paid for were sent to the surface they could have sold 50 or 100 tons more than the 700 tons shown in the report. But it was not policy to turn out all that stuff now, for if they did they would have to put in stages, which would necessitate a much larger expenditure for timber, and it would be more dangerous to work the mine.

A SHAREHOLDER said that the particulars he had referred relative to the cost per ton and the price received per ton were put in the report of South Condurrow Mine.

The CHAIRMAN having again congratulated the shareholders on the improved prospects of the mine, formally moved the adoption of the report and accounts.

Mr. PETER WATSON (the auditor) seconded the resolution, and said he would make a few remarks, having been one of the pioneers in connection with the formation of the company, and having taken a very great interest in the working and progress of the mine. (Hear, hear.) As auditor of the company he visited the mine on Monday last, and was extremely pleased with what he saw. He did not go underground, but he inspected the external works, and everything reflected the greatest credit upon Capt. Waters and all associated with him in the management. As Captain Waters had said, when this company first took over the property, 500*l.* would have bought the lot, machinery and all. The works, under the direction of Capt. Waters, had not been laid out for 5, 10, or 20 years, but for a permanency, and would last long beyond the life of the youngest shareholder. They had been designed and carried out in the most scientific and systematic way, and there were few mines, if any, where the works reflected more credit upon the manager. (Hear, hear.) It was no easy task to find a manager to work as Captain Waters had done, and to stick to the ship and make marketable the lead, and it spoke a very great deal for the unbounded pluck, energy, spirit, and ability with which Capt. Waters had handled the mine. (Hear, hear.) It must be remembered that the mine was abandoned for 25 years, and lying perfectly idle, and then it was taken in hand and worked moderately; but until the present company took it in hand the whole machinery would not have sold for 500*l.* But what had this company done? In the last ten years they had sold nearly 30,000 tons of lead and blende, which had realised the amount of 273,773*l.* Up to the present they had paid in dividends 8*l.* 1*s.* 6*d.* per share, or 96,100*l.*; they had spent 25,000*l.* odd in machinery, and on the 15th of the present month they had on the mine, dressed and undressed, 200 tons of lead. As regards the South Condurrow, and the average cost and receipts per ton of ore, there was just this difference between the South Condurrow and Roman Gravels. He knew South Condurrow and all the district. In South Condurrow and in the majority of the tin mines they brought to surface day by day and week by week all their breakings, and sent them to market, and turned them into money immediately, whereas in this mine, as Capt. Waters stated in his report, there were over 800 tons of lead broken and paid for underground. If that 800 tons had been realised and brought into the accounts then they could get a fair estimate of expenditure, and compare the cost per ton with the receipts per ton. But these breakings could not in this mine be raised and sold immediately, because in working up the men began at the bottom of the level, and as the ore was broken they stood upon it till they got nearer to the next level, after which the breakings were taken away. Therefore, supposing that they wound-up the concern at the present time, there would have to come to credit 700*l.* or 800*l.* more of stuff which had been broken and paid for. (Hear, hear.) Then there was another point to which he would call attention. Shareholders sometimes growled and grumbled, and asked—"Why do you not pay as in 1873, when the shares were 20*l.* each, whereas they are now down to 9*l.* or 10*l.* per share?" Well, the reason was simply this—in the month of April, 1873, they were getting 17*l.* 2*s.* 6*d.* per ton for the lead (the highest price which they obtained), and in the month of April last they got 8*l.* 3*s.* 6*d.* which was the lowest. The price then gradually went up from July to January, when it reached 13*l.* 5*s.*, after which it dropped 2*l.* 10*s.* per ton. Of course, these were the ups and downs in all commercial matters, which they had to bear. But he hoped and believed, as he had frequently said, that the Eastern market would again take a large quantity of lead from this country, and he hoped they had seen the lowest price for lead; therefore, they must take some encouragement and hope for better times. He went through the books on Monday last and found everything well posted up and in good order. He found the actual cost of dressing the lead by the improved jiggers was about 13*l.* 6*s.* per ton. There had been a considerable expenditure in connection with the jiggers during the past 12 months. He did not believe that in any mine in Wales the dressing was done cheaper than in Roman Gravels. If shareholders would go down to the mine

turned in the event of an increase in the price of lead, and in reply to the Chairman, Capt. WATERS said that if desirable when the skip-road was down, and everything completed, he could, if they could get the stuff, with the present machinery return 500 tons per month. The best thing would be for the shareholders to allow him to exercise his judgment, and increase the returns fairly and honestly. (Hear, hear.) He added that he was a holder of 90 shares, which he might have sold for 21*l.* 10*s.* per share, but he did not part with them, and if the shares went down he should like to put a little more money in them. The resolution was then put and carried.

Mr. PETER WATSON proposed the re-election of Mr. Tafnell Southgate as a director. He was sorry to say that Mr. Southgate had recently had very indifferent health, otherwise he would have been here to-day, but he was sure the shareholders would extend their kind indulgence to his friend Mr. Southgate, and would sympathise with him in his indisposition. (Hear, hear.) —Mr. SCHALCH seconded the resolution, which was put and carried.

Mr. ARTHUR moved the re-election of Mr. Peter Watson as auditor.—Mr. COOPER seconded the resolution, and said the shareholders were fortunate in having as auditor a gentleman of Mr. Watson's experience and familiarity with mining accounts. (Hear, hear.) A vote of thanks to the Chairman and directors closed the proceedings.

MELLANEAR COPPER-MINE COMPANY.

The ordinary general meeting of shareholders was held at the offices of Messrs. John Taylor and Sons, Queen-street-place, on Friday, April 30.

Mr. ROBERT HENTY in the chair.

Mr. W. G. WILLIAMS (the secretary) read the notice convening the meeting, and also, to fill up time, the report of the directors, which had been previously circulated.

The CHAIRMAN: Gentlemen,—You will, I have no doubt, be pleased with the report which has been read to you, and particularly with the report of Capt. Gilbert, which shows that in many points the mine is in an extremely satisfactory position. I can say nothing about the future, for past experience prevents me from offering any sort of prediction as to it. We have, undoubtedly, a very good mine at present, and we have every reason to be satisfied with it, for, as far as prospects go, we may look upon it as one that will last us a long time. Only one thing I will predict with certainty, and that is that your directors and managers will use their utmost endeavours to keep it in as good a condition as they can and to make it as profitable as they can, and if anything happens so that it should turn out different to what we expect it will not be the fault of the directors and managers that such will be the case. It is very satisfactory that our reserves have increased, notwithstanding the quantity of ore taken away, which is about as usual. I dare say the amount which has been taken out of the mine will hardly have suggested the total quantity to the shareholders, but, having taken the trouble to go carefully into the accounts, I see that since we have worked the mine no less than 17,000 tons of ore have been taken out, and 58,000*t.*, or nearly 59,000*t.*, has been returned for that ore-statistics which must be highly satisfactory. As the report states, quarterly dividends have been commenced. It was rather the wish of some that it should be so, and that being the case, of course the directors were very glad to fall in with their views. I confess my own feelings are in favour of two large rather than four small dividends in a year. Our dividends have amounted already to 15*s.* on each 2*d.* share—that is to say, of the 20,000*t.* subscribed 8000*t.* has been repaid to the shareholders. That, I think, will be considered most satisfactory, and I hope that in a short time we may find that amount very much increased, and that we shall soon have the gratification of finding that we have been repaid all our outlay. I now propose that the report and accounts be received and adopted.—Mr. SAMUEL J. WILDE (director) seconded the motion.

Mr. M. W. WILLIAMS: What balance is left on the mining and general expenditure account?—The CHAIRMAN: 4800*t.*, after deducting the 500*t.* which we propose to place to it now.—Mr. WILLIAMS: That will have the effect of increasing the available capital?—The CHAIRMAN: That is what it is doing. It is liquidating the original expenditure, and furnishing working capital also.

Mr. RICHARD TAYLOR: The scale of working increasing as it does necessitates the employment of larger capital.

Mr. WILLIAMS: Under such favourable circumstances could not the directors feel in a position to recommend a 3*s.* dividend instead of one of 2*s.*? The CHAIRMAN: We do not think so, because we cannot tell what the state of the copper market will be, and we would rather see our way to pay 2*s.*, and 2*s.* again after a time, than pay 3*s.* now and drop to a lower figure hereafter. (Hear, hear.) It depends wholly and solely upon the price our material will realise. We see no reason why the quantity should diminish.

Mr. WILLIAMS: It is not probable that the price of copper will go much below its present value.

Mr. RICHARD TAYLOR: It has been a great deal lower, and it has fallen back very sadly during the last two months. During this week there is an improved feeling in the copper market, and some little advance, so that we hope things are going to get up again.

The motion was carried unanimously.

The CHAIRMAN: Messrs. John Wild and Samuel J. Wilde are the directors who retire, and they offer themselves for re-election. These gentlemen being present it does not become me, perhaps, to say anything further about them, but I cannot refrain from saying that more trustworthy directors it would be impossible for you to find, or directors who more thoroughly understand their work. It is, therefore, with very great pleasure that I propose their re-election.

The motion was seconded, and carried unanimously.

It was then moved by Mr. RONALD, seconded by Mr. WILLIAMS, and carried unanimously, "that the sum of 12*s.* be paid to the directors for their services during the past year."

Mr. WILLIAMS said this was a very modest payment to be made to the directors. Mr. TAYLOR said it was voted at a previous meeting, and the directors had wished not to have it increased. He hoped to see the day when a much more liberal remuneration would be given to the directors.

The CHAIRMAN: I have to thank you for this vote. I admit what you say—that it is a modest remuneration—but I assure you it is much more gratifying to your directors to come before the shareholders with a good report and a moderate remuneration than it would be with a bad report and a high remuneration. Let me now call attention to another matter, which concerns our managing directors—Messrs. John Taylor and Sons. Our managers brought forward this matter some years ago, after mature consideration, and with perfect confidence that it might turn out as happily as it has done. They negotiated the business, not in the spirit in which these things are generally conducted—by taking a large premium for their remuneration in some secret and underhand way; but without one penny being charged by them beyond the actual cost incurred, they have had a very modest remuneration for their services since the company has been in operation. The directors have considered that matter now, and they think their services ought to be paid more highly than they have been—especially in consideration of their having, without any profit to themselves, put us into possession of what appears to be a most valuable mine. It has, therefore, been proposed and settled by the directors, subject to ratification by the shareholders, that their remuneration, instead of being 300*t.* per annum, shall be 500*t.* That remuneration for the ordinary services they render we consider to be a very moderate amount, seeing what they have done for us. I propose that resolution will be seconded, and then placed before the meeting for adoption.

Mr. S. J. WILDE: I wish to second that very much, because it was I who brought it forward originally without previous consultation with any of my colleagues, and without intimation to Messrs. John Taylor and Sons. I brought it forward a year ago, but at that time Mr. Richard Taylor said that for the time being, looking to the then prospect of the copper market, he would much rather nothing were done. This year, things looking very different, I have brought it forward again, because I consider that 300*t.* a year is quite inadequate payment for the services they render. Bear in mind that they do not receive any of the 12*s.* voted to the directors. It is entirely owing to Mr. Richard Taylor and his son that this company exists. The son inspected the mine some time previously, and spoke of it very highly. The difficulty the old company had was the management. They were beaten by the water, and their machinery was always breaking down. Mr. Richard Taylor thought he saw his way out of the difficulty. The new company was started, and he set to work. The broken machinery was got out without damage, and at a very low cost compared with what was predicted. Since then, Mr. R. Taylor has taken a great deal of trouble with the mine, and often goes to visit it. They received 2½ per cent. upon the nominal capital of the company, but that repaid them only for the costs they incurred in connection with its formation. I do think 500*t.* a year is not a penny too much for them to receive.

Mr. RICHARD TAYLOR: The directors will bear me out when I say it was with considerable hesitation that I, on the part of my firm, agreed to this proposal, because we should be most averse to taking that which was not accorded to us with the most complete approval by the shareholders. It is true it is a concern which the shareholders owe to us personally. One of my sons, who is now no more, inspected this mine during the time the former company was in great difficulties, and he gave me such an account of it as satisfied me that there was a great future for the mine so far as productiveness went, because they had touched the ore in one of the western levels, and its appearance was that which to any practical miner would indicate the probability of a great deal more being connected with it. He also satisfied me that we need not fear the difficulties that had completely baffled the former company. They by want of knowledge, want of watchfulness, and want of resources of several kinds, which alone could overcome such difficulties, failed utterly, and at last abandoned the attempt to work the mines, and allowed them to fill with water. Such was the state in which we took the mines over. I am trying to form a company, reckoned a good deal on the local support of some wealthy friends, and was very much surprised that I did not receive it, but it was soon explained, for they said the whole had fairly formed our company that the attempt to keep these mines drained would be more than we could accomplish. It is three months ago that, in talking to one of these gentlemen, I found they had been utterly astonished at our success. It did not take a great deal of trouble, only it required the assistance of very first-rate agents to do what we did. We have never had a day's interruption since we started, although what ruined the former company was the frequency of the interruptions. They would get down to the bottom, and then begin to sink the shaft, and would not be at it a week before something went wrong, and the water rose again, and half filled the mine. We drained the mine without difficulty, taking all the necessary precautions. We used the same machinery, but we applied it as ought to be applied, and we exercised, as I say, constant watchfulness and skill, and we had one of the best mining agents in Cornwall to help us. As to the mine's productiveness, we have sampled between 500 and 600 tons monthly, and sometimes a little over each alternate month, and to do that it has required a good knowledge of mining and attention to the necessary arrangements, and I do not wish to disclaim that I have had an important part in the management of the mine. (Hear, hear.) In a business like ours we are obliged to divide our duties, so that you hear very little of my brother in connection with our Cornish mines, just as you hear very little of me in connection with those in Cardiganshire, in which I know some of the gentlemen present are interested. Cornwall is my district, and Wales is his. I visit the mines never less than six times a year—every second month—and sometimes

oftener, and I must say I feel conscious of no neglect in your service, and if it should please you to vote that which the directors think a fair remuneration for what we have done we shall very thankfully accept it, but if, on the contrary, there should be any diversity of opinion, or any doubt as to whether it should be paid, let it be at any less sum you think fit, always bearing in mind that we are entitled to 300*t.* a year, and that there is a provision in the Articles for its increase, but no provision for its decrease.

A SHAREHOLDER said he was very pleased that this matter had been brought forward. He believed this was the only copper mine in England that continued to pay dividends without any interruption.

Mr. TAYLOR said he knew of no other copper mine that had done so.

The motion was then carried unanimously, and the CHAIRMAN, in announcing this result, said that of course the directors were better able to form an opinion of the value of the Messrs. Taylor's services, seeing that they were acquainted with the working of the company day by day.

Mr. WILDE: We have always in other companies found them ready to decrease their remuneration when the mines were not looking so well.

Mr. RICHARD TAYLOR, in returning thanks, said they had never hesitated when they found their mines getting poorer to volunteer a reduction of their salaries.

The CHAIRMAN proposed, and Mr. WILLIAMS seconded, the re-election of the auditor—Mr. Hurhett—which was agreed to.

Mr. RICHARD TAYLOR then gave a statement of the workings at the mine, but without the map with which he illustrated his remarks a full report would not be understood. He remarked incidentally that it was now 50 years since he was appointed to the management of the Consolidated Copper Mines, in Cornwall, and he had inspected a great number of the copper mines in Cornwall from time to time, but he knew scarcely another instance in which a lode had been so constantly and uninterruptedly productive for such a length as the main lode in Mellanear. The levels were now advancing into the western ground, of which they had a large tract yet unexplored, and they were still productive. In fact, all the levels they had driven had been throughout more or less productive. The main engine-shaft was now down to the 110*f.*, and there they still had ore, though temporarily not so rich as found further east and west in the levels above. Still, it was very good ground. Beyond the unexplored ground there was another old mine, called the West Wheal Alfred, which was also included in the company's sett, and which produced some very rich courses of ore in the upper levels, but was not worked to any great depth. They intended to underwater this, and possibly they might have to provide additional steam-power, and it was with a view to that very much that they had advised the directors gradually to accumulate a good reserve fund. The quantity of ore laid open was nearly 16,000 tons, chiefly upon one lode. At a short distance west of Gundry's shaft another lode has been found, striking off south of this lode, and coming back by the side of the workings already made. Its direction is more to the south of east than the main lode. The 70 produced 3 tons per fathom, the 60 3 tons, and the 50 4 tons, and all are developing very fine courses of ore. An immense addition to the value of the mine has taken place, chiefly in the last year. The water is completely under command, and we have commenced sinking the old shaft in the eastern part of the mine. I am not so sanguine of this part of the mine, but still it is a part we ought to try, and we shall do so. The quality of the ore keeps about the same, and the increased price is the result of improvements we have introduced in dressing it. (Hear, hear.)

It was decided by a subsequent resolution to have only yearly meetings, and to send out a statement of the progress of the workings once a quarter.

A vote of thanks to Mr. Henty for presiding and to the directors and managers closed the meeting.

GLANDOVEY SLATE COMPANY.

The first annual general meeting of shareholders was held at the company's office, Great Winchester-street, on Monday,

Mr. WHITE in the chair.

Mr. BURROWS (the secretary) read the notice convening the meeting, as also his report of his recent visit and inspection of the quarries, as follows:

May 1.—Within the last two months I have visited the quarries several times, which we are now, and have been for some time, working; and the further we drive into the rock the more it improves in appearance. The slate cleaves and splits freely and regularly, and a large quantity of slates has been made, and slabs of many tons weight have been got out. The machine-house has been erected, and the large water-wheel fixed in its place at the end of the machine-house. The machinery, which is on the quarry, is in course of being put up in the machine-house, and will I expect be complete in a week, and when this is done we shall turn out very large quantities of slates and slabs every month. The slates are of a good colour, and free from spots, and equal, in my opinion, to the best Bangor slates, and slabs can be made of any size. Tramways have been laid down from the opening to the rubbish-tips and machine-house, and some more trucks have been made. A reservoir has been constructed, with flood-gates, so as to regulate the stream, which is carried on to the wheel by landers, and which will work all the machinery. Arrangements have been made with the Cambrian Railway Company for a wharf at Glandovey Station, with sidings on to the line for the use of this company.—J. W. BURROWS, Secretary.

The report and balance-sheet having been adopted, the CHAIRMAN congratulated the shareholders on their possession of so valuable a property. The company was now in a position to turn out slates and slabs of a quality second to none, and at a less cost than any other quarry in the district. The purchase of the property had been completed for 5000*t.*, and the directors were now in a position to issue a limited number of 10 per cent. first mortgage debenture bonds for extending the company's operations. The whole of the company's property is placed in the hands of two trustees, in order to thoroughly secure the debenture-holders.—The directors retiring by rotation were re-elected.

A vote of thanks to the Chairman and directors concluded the meeting.

TEMPLE LEAD MINING COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, London, on Friday, April 30.

Mr. J. W. WILLIAMSON, the Chairman, presiding.

Mr. CHARLES THOMAS (the secretary) read the notice calling the meeting. The minutes of the previous meeting were read and confirmed.

The CHAIRMAN said: Gentlemen, in proposing the adoption of the report and accounts, I should like to say a few words upon the position of the mine. It was thought advisable that the last half-yearly meeting should be held upon the mine, and in accordance with that view was attended, and I certainly was exceedingly surprised and pleased at what I saw on the mine. The works were certainly in the very highest possible order. The mine itself is by no means in an advantageous situation—that is to say, it is most admirably situated as regards the river, and as regards an unlimited supply of water, but inasmuch as we are on the side of a mountain, it is very difficult to get proper ground for dressing-floors, and for the necessary buildings, and consequently some expense has had to be incurred in levelling the ground and blasting the rock in order to make room for the necessary works. I can only say for myself—and my experience of mining is of very ancient date—that I have never seen a mine with the machinery and everything connected therewith more compact or in better order and condition than the Temple mine, and it reflects great credit upon the manager and secretary and all who have had anything to do with laying it out. Of course, the main point is—is there anything, after all this outlay, to repay us for it? Well, all of us were underground; at that time we were in one of the winzes, and as far as I could judge (and I think my opinion was corroborated by those present who were quite able to judge) the value of the ore at that time might be assumed to be from 1½ to 3 tons per fathom. Such a state of affairs as 3 tons per fathom cannot be expected to go on for ever, and we must allow for changes in strata, which sometimes cause the lodes to spread out, and sometimes bunchy, but I think we may fairly assume that we have a good mine there. What it will turn out in depth we cannot say, but the indications are that as it goes down it will improve. We saw the ore which was dressed, and I never saw cleaner, or neater, or better dressed ore in my life. We have at the present moment over 60 tons dressed and ready for market, and I should say there is a large amount of ore in the levels which might be got out and brought to market at this present moment. I should think we might easily get from 1000*t.* to 2000*t.* worth of ore; taking what we have in hand, and dressed and what there is now to be stopped away, and what may be ultimately stopped away, is a great deal in excess of that amount. Perhaps it may be said—Why is it so far satisfactory that we have driven at about twice the speed that we were driving by hand-power, and in sinking we have perhaps obtained a rather more favourable result. At the same time, we do not consider we have achieved all that is to be obtained by the boring machine. We are led to believe by inventors and practical miners who have worked the machine that we may fairly expect to drive at four times the speed we formerly drove by hand, and that we may sink in like proportion. I need not say if we do this it will be a very desirable result. I am happy to say that, although it has generally been found in first commencing the use of the machine, the price of driving the ground is, much greater than by hand-power, yet in our case by the aid of water, which is our motive power, we have been able to work the boring machine at a less cost per fathom than we worked by hand-labour; and I have no doubt that ultimately the cost at which we are now working will be much reduced per fathom, so that we should get not only increased speed, but our work done at a lower price. (Hear, hear.) I am not prepared to say anything further with respect to these machines, for the short time we have had them and tested them is not sufficient to enable the best results to be obtained, or to allow of making any definite statement regarding them. As soon as we have worked them sufficiently long to test their durability and efficiency, and to give us some data upon which we can estimate the advantages to be derived from their adoption, I will make a definite report respecting them and the work they perform; but at present I will not say more regarding them than I have said. The Chairman has alluded to the difficulty with respect to the carriage of the ore. The difficulty arises, in the first place, from the ore being dressed at the bottom of a mountain. We have made an incline tramway, and provided a drawing machine, to be worked by a 40-ft. water-wheel, and drawing machine, and laid down the incline, and also laid other tramways, all of which are necessary for the economical working of the mine. In addition to these matters, we have purchased and erected a complete rock-boring apparatus. An air-compressing engine has been attached to the 40-ft. water-wheel, and 3 inch cast-iron pipes have been laid from the compressor throughout the mine, in order to enable us to drive and sink by the aid of this apparatus. The rock-boring machine which we have provided are those which we consider to be most suitable to our purpose. It has taken us a very considerable time to decide upon these bores, and everything has been done by myself and others by inspecting the different machines which have been offered to the public, and when opportunity offered of seeing them in operation at different places; and the conclusion we came to before purchasing was that those which we have adopted were the most simple in construction, and, therefore, the best to put in the hands of a miner. We have had but little time at present to prove the machines; but the tests which we have had have been so far satisfactory that we have driven at about twice the speed that we were driving by hand-power, and in sinking we have perhaps obtained a rather more favourable result. At the same time, we do not consider we have achieved all that is to be obtained by the boring machine. 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returned many thousands of pounds worth of ore. We hope to get the lode in the cross-cut within a distance of 50 fathoms of our present works, and in all probability we shall intersect one or two lodes or branches before we reach this very important lode, but whether they will prove productive or not I cannot say. The great object is to cut the lode which is known as the Champion lode of the district.

The resolution was then put and carried without any discussion.

The CHAIRMAN then proposed "That the course adopted by the directors in raising 2500*l.*, upon debentures be approved."—Mr. HERETAGE seconded the resolution.

Mr. CHARLES THOMAS: With respect to this sum of money, I may say that only one circular note was sent to the shareholders inviting them to subscribe the 2500*l.* on debentures, bearing 5 per cent. interest, and in response I have had applications for rather over 2000*l.*. I have not made any further application, nor alluded to the matter again, but probably a further appeal to one or two of the larger shareholders would be sufficient to induce them to subscribe the other 500*l.* (Hear, hear).—The resolution was put and carried.

On the motion of the CHAIRMAN, seconded by a SHAREHOLDER, Mr. William Baldwinson was re-elected a director.

Mr. BALDWINSON acknowledged his re-election.

On the motion of the CHAIRMAN, seconded by Mr. CHARLES MORRIS, the auditor, Mr. R. Cumming, was re-elected.

The usual complimentary votes closed the proceedings.

WHEAL UNY MINING COMPANY.

A general meeting of shareholders was held on the mine on Tuesday, —Mr. RICHARD BOYNS (of St. Just) in the chair.

Mr. WALTER PIKE (the purser) read the statement of accounts, which showed a loss on the 16 weeks' working of 759*l.* 7s. 6d., and that the balance against the mine was 2422*l.* 11s. 3d. At the last account the debit balance was 2661*l.* 8s. 5d. The quantity of tin sold since the last meeting was about 73 tons, at an average value of 55*l.* per ton.—Capt. RICH explained the present workings of the mine, and remarked that the agents had been blamed for not having made more of the accident that occurred in King's shaft, but he did not see what would have been gained by doing that. He had no desire whatever to hide anything from the adventurers, but when they had a breakage it was much better to set about repairing it than to talk about it. They had now got over that difficulty, and they had also a good deal of tinstuff underground, but the accident, unfortunately, hindered them considerably. In the present accounts they had not credited any tin, although under the circumstances they might, perhaps, have been justified in doing so. Everything was sold up to last Saturday, and in spite of the accident they had sold rather more tin than on the last occasion.—Mr. THORNE suggested that the two months' costs in arrear should be brought up, so that they might know their exact position.—Capt. RICH saw no objection.—Mr. BAIN concurred, believing the unknown was dreaded much more than what they really knew.

Mr. WALTER PIKE would be very glad to accede to the wishes of the adventurers, and in issuing the accounts he would send out a supplementary statement showing what their exact position was. By bringing their costs up as suggested the balance against the mine, including the merchants' bills to the end of March, would be 4550*l.*

Mr. J. HICKY (London secretary), in reply to Mr. Thorne, stated that the shares were never actually forfeited. A resolution was passed forfeiting them, but before that resolution could be confirmed at a subsequent meeting the arrears of call were paid, and the shares were accordingly restored.

Mr. J. C. ISAAC believed, as a large shareholder, that the value of their property would be greatly advanced if they made a call sufficient to pay off the balance that was due. They might then look forward at the next meeting to realising a profit, and dividing it among the adventurers. It was a very great mistake to have large debts remaining unpaid, and they might depend upon it that people would not go into mines to invest their money where they saw that there were large adverse balances which had not been met by the shareholders. He should, therefore, support the making of a call of 1*l.* per share.—Mr. PERMEKAN seconded this motion. He was convinced that in Wheal Uny they had a very valuable property indeed, and in the interests of the mine he was very willing to pay the suggested call. It was no good for them to go as they had done. They wanted a little more spirit, and he was quite sure that the mine would soon be in a paying position.

There was an amendment to make the call 10*l.* per share, but upon its being put to the meeting very few voted for it, and the 1*l.* call was carried by a large majority.

Mr. LANYON said there was a strong feeling that they could not afford to go on with an expenditure which could not be shown to be in any way contributing to the interests of the mine. There was one item of expenditure in particular, which was not a heavy one, but which was nevertheless regarded as unnecessary—he referred to the London office, which had existed for many years. Wheal Uny was largely represented there that day, and he was anxious to take the sense of the meeting as to whether the London office and the committee were essential to the interests of the mine. He proposed, however, in dispensing with the services of Mr. Hickey, the London secretary, that they should pay him four months' salary, and thank him for what he had done in the past.

Mr. ISAAC seconded the motion, and it was agreed to.

THE WICKLOW COPPER MINING COMPANY.

The half-yearly meeting of shareholders was held at the offices, Grafton-street, Dublin, on Friday.

Mr. GEORGE TICKELL, J.P., in the chair.

The directors' report for the half-year ended March 1 was as follows:—

"The limited business done in minerals during the half-year would have been attended with somewhat greater profit but for an exceptional outlay in clearing the debris from the iron lode to get access to the ore, for which a demand had arisen owing to an improvement in the iron trade. On the other hand, the demand for pyrites was under the average. The period comprised in the accounts includes but little of the season when artificial manures are in demand, and it was not until very shortly before the close of the half-year that any sales were effected. The collapse of agricultural credit has curtailed the credit very seriously, and having large stocks on hand the directors are reluctant to manufacture any considerable quantity this year. The prospect of a good harvest has done something to inspire confidence, and the directors trust to be able to report to the next meeting that satisfactory sales have been made of the existing stocks. The company's agents and customers continue to be well pleased with the quality of the Arklow manure, and the company has retained its trade connection notwithstanding the competition of manufacturers who offer their goods at prices which render it impossible for them to supply the consumers with a genuine article. The property of the company at the mine, at the manure works, and at the harbour has been maintained in good condition."

The CHAIRMAN moved that the directors' report and statement of accounts be received and adopted, observing that the directors had been working very hard, but with very small results. However, they did not stand alone in this particular, as the whole country was in a very bad state, and he presumed that those shareholders interested in other concerns must have felt the effect of the depression. He found that to a certain extent they were eating into their capital, and he thought it would be their duty at the next, or perhaps before the next, meeting to consider what would be best to do, unless some considerable improvement in trade set in immediately. Up to March 1, when the accounts closed, they transacted little or no business, though they had made every proper effort to produce a contrary result.

Mr. HENRY asked some explanation of the extraordinary difference between the accounts of the past and previous half-year. There had been a difference as regarded the manure of 1300*l.* between the half-year ended September, 1879, and the last half-year ended March 1.

The SECRETARY replied that in the first half-year of the company's dealings in manure, which ended on March 1, 1878, they manufactured 6000*l.* worth of manure, at a profit of 234*l.* In the following half-year, ending Sept. 1, they manufactured 12,000*l.* worth, but in consequence of the very high price of materials their profits were only 240*l.* During the first half-year of 1879 they manufactured 5300*l.* worth of manure, with a profit of 370*l.*, and during the September half-year 9000*l.* worth, with a profit of 110*l.* Then in the half-year now closed they manufactured 925*l.* worth, and the loss sustained was 20*l.*

Mr. HENRY said these figures showed a vast falling off, and he thought exertion might be made to sell the 9000*l.* worth of stock on hand.

The CHAIRMAN reminded him that the best period of the year had yet to come.

The stock could be disposed of without any difficulty, but it would have been unwise to attempt this when the question was would they ever receive payment?

Competition from the other side of the water was very great, and manure was then manufactured and sold at a price this company, with all its capabilities, could not afford to sell it at.

It was then unanimously resolved, on the motion of Mr. HENRY, seconded by Mr. WOODS, that the passing of the accounts be postponed, that a special meeting be called for May 14, and that an estimate of the value of all stocks be prepared and submitted to that meeting.

NERBUDDA COAL AND IRON COMPANY.

The twentieth ordinary general meeting of shareholders was held at the offices, Finsbury Circus, on Tuesday.

Mr. SAMUEL J. WILDE (the Chairman) presiding.

The notice calling the meeting was read by Mr. FRED. R. BLUETT, the secretary. The report and accounts were taken as read.

The CHAIRMAN said that the manager in his report entered so fully into the state of the company's affairs that he would not take up much of the time of the shareholders to-day, but should be happy to answer any questions. In the second paragraph of the report reference was made to the quantity of coal raised, and also to the large amount which was used, apparently, for colliery purposes. He was happy to say that, according to a letter received from the manager that morning, that was a matter which would soon be corrected, as the manager stated that he now saw his way clear to concentrating the steam power, and thus effect a saving in the consumption of coal. The output had been small owing to various causes. One serious thing which had troubled them so long he hoped and believed they had now got rid of, and that was the fire in the mine, and this belief was corroborated by the latest accounts from the mine. It would be seen from the report that the output to Feb. 29 last were 2149 tons, and the deliveries—that is to say, coal sales—to March 20 last were 1141 tons, against 690 tons to the like date of 1879, but by the fast letter received from the mine the entire quantity had been increased to 4763 tons, against 2235 in the previous year, which was satisfactory. With regard to the Georgina pit it was started because the manager thought he could get the coal there much sooner than in the spot known as the New Winning.

In the report it was shown that it was down to 40 ft., but in the letter received to-day it was stated that it was down to 60 ft. The manager estimated that he would complete the shaft within a year-and-a-half from last October, so that he hoped within the time stated they would be in coal out of the shaft, but whether they would raise much coal for the first two or three months was another thing. There was another satisfactory thing about the coal. The cross-cut going in the direction of the new winning had cut a dyke, and after going 30 yards through a stone drift the coal had been found, and was 4 ft. 6 in. thick. The manager stated that one thing might now be considered to be fairly proved, and that was that coal actually existed on the Mulpey Plain, and as there was a large area there of course this was very important. He might mention that the last call had been extremely well met. The directors had closed the Birchman Copper Mine. They did hope at one time that something valuable might come from there. The ore was reached, and Mr. Lightly, who was on business in India for Messrs. John Taylor and Sons, reported it to be well worth exploring, and in his verbal report to Messrs. John Taylor and Sons, he spoke much more strongly than in his report. But it seemed that they were mere pockets of ore, and there was an end of it. The company had not spent much money upon the mine; the total amount of outlay was about 1200*l.*, and of this about 500*l.* had been returned from the sales of ore. Referring to the accounts, he drew attention to the fact that the auditors, Messrs. J. Waddell and Co., in their report, stated—"We again call attention to the want of detailed lists and valuations of the block and plant, buildings, tents, furniture, live stock, timber, and stock certified by the manager in India." He quite agreed with the auditors that these detailed lists and valuations ought to be sent over. The auditors went on to say—"We are of opinion that a certain sum, to be ascertained, should be written off the above against revenue for depreciation." He had gone into the matter with the secretary very fully, and the plan he had urged the directors to adopt was that when the company got into a dividend-paying state they should charge everything to revenue, especially in a mine situated abroad, as there was then less chance of temptation or opportunity of cooking the accounts. But the cost of the new shafts the directors were fully justified in charging to capital. If they charged everything to revenue it was not fair to charge depreciation also; provided they allowed money to be spent upon the property it did not matter whether they called it depreciation or whether they paid for what might properly be called capital charges out of revenue. They had received 115,000*l.*; the revenue expenditure from 1874 to 1879 had been 71,717*l.*, and the dividends paid amounted to 15,190*l.*; and they had spent upon what might fairly be called capital charge, out of revenue, 28,839*l.* Of course, the shareholders could hardly expect auditors to look back; but if the auditors had done so they thought they would not have found it necessary to put in the paragraph about depreciation. Having referred to the excellent manner in which Mr. Jackson, the mine manager, had performed his duties since he went out at the beginning of last year, the CHAIRMAN concluded by moving the adoption of the report and accounts.—Mr. JOHN R. MANNING seconded the motion, and said it was a matter of great importance that the coal had been struck on the Mulpey Plain.—The resolution was put and carried.

The retiring directors, Mr. J. R. Corbett and Mr. T. S. Havside, were re-elected.

The CHAIRMAN expressed his regret at the resignation of Mr. John Hawkins, who had resigned his position at the board in consequence of not being able to attend to the duties with regularity.

The CHAIRMAN, in answer to a question, said that the board did not contemplate making any further call. The relations of the company with the Great Indian Peninsula Railway continue satisfactory.

The auditors, Messrs. J. Waddell and Co., were then re-appointed.

A vote of thanks was then passed to the Chairman and directors.

The CHAIRMAN acknowledged the compliment, and said there was no doubt that things at the mine were now looking better than they had ever looked before.—The meeting then broke up.

GENERAL MINING ASSOCIATION.

The ordinary half-yearly general meeting of proprietors was held at the Cannon-street Hotel, on Friday, April 30,

Col. E. W. SCOVELL (the Chairman) presiding.

Mr. C. G. SWANN (the secretary) read the notice convening the meeting.

The CHAIRMAN said that in submitting the report and accounts for 1879 it was hardly necessary to repeat what he said on the occasion of the last half-yearly meeting, the minutes of which had been read, and a full report of which was sent to the registered address of every shareholder. He then endeavoured as far as he could to explain what had been the character and nature of the season's operations, and he entered as fully into the details as he could short of the final result itself. With that final result, and with the financial position of the company, and with the affairs of the association generally, they were more concerned to-day, and to those he would confine their attention at present by turning at once to the accounts and report. It would be within the remembrance of shareholders that he stated at the last meeting, about the first week in December, that the sales of coal had been much upon a par with those of the previous year, and he expressed the hope that the final result would not show any decrease. The shareholders would have seen by the report now in their hands that the result of the two years were almost identical, and that whilst at Sydney they had sold 1800 tons more, at Lingan they had sold 1338 tons less, making an increase of 472 tons upon the year's operations. This was very much in accordance with what he predicted. With regard, however, to the financial results of these sales, it would be well to confine themselves first to the Sydney Mine, which was more beneficial, and whence their profits had been made. They would see by comparing the prices received for the same quantity of coals—102,000 tons in 1878 against 103,350 tons last year—that the sum received was 44,000*l.* against 41,700*l.* in the previous year. A portion of that was accounted for by the less amount charged to the coal in working the mine. It really made a difference of about 100*l.* in the actual sum received for the coal, and was accounted for by the continuous competition which he then spoke of, and extended discounts, particularly to steamers and others, whose custom the company were anxious to secure and retain, and this they did. This would account for 3*l.* of the diminished dividend; 6*l.* was accounted for by the less amount brought over, and the remaining 1*l.* 6*d.*—the difference between 4*l.* and 2*l.* 6*d.* now proposed to be distributed—was made up, he was sorry to say, in increased working expenses, which was accounted for partially by the increased cost of materials, consequent upon the imposition of a duty, and partially by the greater consumption. This was a matter which had caused the directors he would not say considerable anxiety, but they had examined strictly into it, and the manager had rendered such an explanation of it as he could, and had sent very full details of the increased cost. The increase partly was referable to a flaw in the seam, partly to dead work, and partly from working round a quantity of stone. The wages for raising the same quantity of coal were about 100*l.* more than in the previous year. In the previous year it amounted to 20,300*l.* in Sydney, and last year to 21,000*l.*; but the chief difference was, as he had said, in the quantity of material consumed. This again, was partially accounted for by the introduction of the underground haulage and the better ventilation of the fans. The underground haulage was now performed by steam-power, which was conducted below. The discharge of the steam had had the effect of increasing the liability of the roof to fall, and necessitated greater care in the working of the coal. With these exceptions the working expenses were much about the same. There was a decrease in the amount of coal consumed in the mine—the decrease in the quantity, and partly in the decreased price which the company charged itself. The profit upon the Sydney Mine had been 5700*l.* against 8700*l.*, which was attributable to the causes he had mentioned—chiefly to the decrease in the receipts for the same quantity of coal, and to the increase in the working expenses. There was a loss upon the Lingan Mine, but a less loss than the year before. The directors had always endeavoured to limit the works at Lingan—to keep the mine open, but not to enter upon any extended underground work, which were not required. The loss on the Lingan Mine amounted last year to 1350*l.*, against 1900*l.* in the previous year. The entire profit on the year's operations amounted to 3596*l.* 13s. 1d., which, added to the 258*l.* 9s. 2d. brought forward from the previous year, made a total of 3855*l.* 3s. 1d. Out of this the directors proposed to ask the shareholders to sanction a dividend of 2*l.* per share, which would absorb 3433*l.* 12s. 6*d.*, and then there was Mr. Ford's pension of 250*l.*, the two items together making 3683*l.* 12s. 6*d.*: leaving a balance of 171*l.* 10s. 7*d.* to be carried forward to the current year. Turning to the report, the shareholders would see that the negotiations with the Spring Hill Company had been concluded. The conditions were 13,000*l.* in money, and a certain number of the shares of the Spring Hill Mining Company—3205 shares of 10*l.* each. A portion of the 13,000*l.* cash had been received. The property which had been sold to the Spring Hill Mining Company stood in this company's books at 83*l.* There had been paid to the secretary a commission of 50*l.* for negotiating the transaction. Of the sum received 875*l.* had been written off on account of mining leases. That was an amount which was the end of the balance of the working of the mine, being 150*l.* against 200*l.*, which was partly a decrease in the quantity, and partly in the decreased price which the company charged itself. The profit upon the Sydney Mine had been 5700*l.* against 8700*l.*, which was attributable to the causes he had mentioned—chiefly to the decrease in the receipts for the same quantity of coal, and to the increase in the working expenses. There was a loss upon the Lingan Mine, but a less loss than the year before. The directors had always endeavoured to limit the works at Lingan—to keep the mine open, but not to enter upon any extended underground work, which were not required. The loss on the Lingan Mine amounted last year to 1350*l.*, against 1900*l.* in the previous year. The entire profit on the year's operations amounted to 3596*l.* 13s. 1d., which, added to the 258*l.* 9s. 2d. brought forward from the previous year, made a total of 3855*l.* 3s. 1d. 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Registration of New Companies.

The following joint-stock companies have been duly registered:—

INDIAN GOLD FIELDS CO-OPERATIVE ASSOCIATION (Limited).—Capital 1,200,000*l.*, in shares of 12*l.* and 12*l.* To acquire by purchase or otherwise any lands, mines, minerals, mining rights, or other properties in Southern India or elsewhere. To work the different gold-mining properties and to win, crush, wash, smelt, reduce, and amalgamate and sell the ore and develop the resources of such properties. The subscribers (who take one share each) are—A. N. Ford, 17, George-street, surgeon; I. W. F. Nuttall, 40, Barons-court, road, General, 40; G. Wray, Rotherfield, gentleman; J. W. V. Simons, 19, Manley-terrace, shipowner; G. J. Aman, Flint, gentleman; H. J. Pratt, 9, Upper Hornsey-place, gentleman; T. B. Lowe, 14, St. James's-square, gentleman, I. The subscribers will appoint the directors, the number of whom must not exceed nine or be less than three, the remuneration to be determined by the shareholders in general meeting.

DRAKE'S PATENT CROWN STEEL WORKS (Limited).—Capital 60,000*l.*, in shares of 10*l.* To manufacture for sale iron, steel, and other substances generally. The subscribers (who take one share each) are—S. Page, 4, Hanover-street; E. Hunt, East Dulwich; J. B. Ball, 1, Gresham Buildings; C. W. Cornish, South Hackney; H. Puckle, Camberwell; B. Calway, 8, St. Benet-place; E. Toppin, 2, Cloak-lane.

HAMER'S MERCANTILE COMPANY (Limited).—Capital 6000*l.*, in shares of 1*l.* The manufacture, purchase, and sale of coal, coke, lime, bricks, slates, tiles, &c. The subscribers (who take one share each) are—E. Hamer, Aberystwith; W. Williams, Aberystwith; E. Humphreys, Aberystwith; J. Watkins, Aberystwith; A. J. Hughes, Aberystwith; J. Morgan, Aberystwith; H. Hughes, Aberystwith.

THE HAWKSTON CHINA-CLAY COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To carry on the business of mining and trading in china-clay, stone, or any other clays. The subscribers (who take one share each) are—J. F. C. Norman, 77, King William-street; E. Young, 6, St. Swithin's-lane; J. C. Gregory, 52, Queen Victoria-street; A. Craig, 3, Bow-lane; J. C. Holland, 12, South-square; G. H. Cammell, Sheffield; R. Wainwright, 77, King William-street.

THE WEST KENT AUCTION AND ESTATE COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To carry on the business of auctioneering, house and estate agents, builders, &c. The subscribers are—C. Bloy, Aslacton, 1; E. S. Fludger, Plumstead; W. H. Fludger, Woolwich, 1; J. O'Connell, Plumstead, 1; W. Mooroff, Woolwich, 10; H. E. J. Fontaine, Plumstead, 1; W. J. Vance, Woolwich, 1.

PEEL PARK VIEW COTTAGE BUILDING COMPANY (Limited).—Capital 31,980*l.*, in shares of 60*l.* To carry on the business of a building and land society. The subscribers are—T. Walton, Bradford, 46; F. S. Denton, Bradford, 23; F. J. Chambers, Bradford, 23; T. Condingly, Bradford, 12; A. Condingly, Bradford, 11; H. Hunchcliff, Bradford, 23; B. Hunchcliff, Bradford, 23; F. Stake, Bradford, 92; H. Archer, Bradford, 92; S. Jackson, Bradford, 92; G. Bolton, Bradford, 20; J. Picklane, Bradford, 20.

THE TYNEMOUTH AQUARIUM AND SUMMER AND WINTER GARDEN COMPANY (Limited).—Capital 35,000*l.*, in shares of 10*l.* and 1*l.* To continue a business already established at Tynemouth. The subscribers (who take 10 shares each) are—T. Gray, Newcastle; T. Foster, Tynemouth; J. E. Youll, Newcastle; G. C. Barker, Newcastle; M. Fairland, Huddersfield; R. Johnson, Newcastle; S. Sims, Newcastle; H. C. Norman, 368, Euston-road.

LAND DEVELOPMENT ASSOCIATION (Limited).—Capital 20,000*l.*, in shares of 10*l.* To carry on the usual business of a land and estate company. The subscribers are—W. Shirley, Eton, 30; A. C. Willis, 3, Hare-court, Temple, 30; W. C. Banks, 39A, Gracechurch-street, 1; J. H. Braund, Plumstead, 1; H. Kent, Old Charlton, 1; W. Eichhalz, 2, Aldermanbury, 30; J. O. Braund, Lewisham, 1.

THE NEWTOWN AND BEAULIEU OYSTER FISHERY COMPANY (Limited).—Capital 10,000*l.*, in shares of 10*l.* The breeding, culture, and sale of oysters. The subscribers are—Lord H. Scott, Beaumaris, 130; A. Boyle, West Cowes, 130; J. B. Bird, West Cowes, 30; A. H. Estcourt, Newport, 30; B. Simeon, Swainton, 30; E. J. P. Watts, Newport, 1; A. G. Estcourt, Newport, 1.

THE BREWERS' SUPPLY ASSOCIATION (Limited).—Capital 50,000*l.*, in shares of 50*l.* To carry on the business of brewers and maltsters generally. The subscribers are—J. S. Wood, Southwark, 5; W. E. Caddell, 59, Mark-lane, 5; J. S. Northcote, 67, Wellington Buildings; G. U. Adams, Brockley, 1; B. R. Wood, Stoke Newington, 13; G. A. Hemming, 3, South-square, 1; H. Coghill, Shepherd's Bush, 1.

THE WEARDALE MINES (Limited).—Capital 70,000*l.*, in shares of 5*l.* each. To purchase or otherwise acquire the Sunnyside Iron and Lead Mines, situate in the parish of Wolsingham, county Durham, along with the machinery, plant, and other effects connected therewith; also to obtain a lease of mines adjoining, known as Holebeck, with power to let, lease, sell, enlarge, or otherwise dispose of same. To search for, win, and raise all ironstone, iron ore, lead, and other metallic ores and minerals whatsoever. The subscribers (who take one share each) are—G. F. James, 27, Finsbury-place, decorator; G. Henon, Deptford, iron founder; J. Branson, 63, Ladbrooke-grove, gentleman; W. Rowland, 75, Gracechurch-street, consulting engineer; H. Willshire, West Kensington, gentleman; G. Peverall, Peckham, commission agent; W. White, 4, Change-alley, assayer. The sum of 500*l.* to be divided annually by the board, the subscribers being empowered to appoint the first directors, whose number must not exceed five, or be less than three.

THE NEW LLANFAIR MINING COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To adopt and carry into effect a certain agreement made between J. H. Buck and J. Williams on one part and A. Streeton on the other part, for the acquisition and working of the Tyserig Mines, situate in the parish of Genoil Gais, Carmarthenshire; acquiring any other mines suitable to the purposes of the company, and to carry on the business of a mining company in all its branches, purchasing and selling or otherwise dealing with all ore and minerals. The subscribers (who take one share each) are—T. G. Brown, 4, Change-alley, assistant chemist; E. H. Glover, Romford, manufacturer; S. L. Watts, Balham, clerk; F. J. Pearce, 91, Queen's-crescent, traveller; F. Miles, 2, Osborn-road, commission agent; W. A. Byron, 49, Old Bailey, publisher; G. Marshall, 80, Pollock-road, clerk. Registered without Articles of Association.

THE ENGLISH YEAST COMPANY (Limited).—Capital 110,000*l.*, in shares of 1*l.* To purchase and work patents appertaining to the manufacture of yeast or beer. The subscribers (who take one share each) are—J. B. Coombs, 14, Great Winchester-street; H. Fenwick, 47, Windsor-terrace; S. C. Fox, 53, Finsbury Park-place; E. Lindsay, 63, Queen Victoria-street; W. D. Ruck, 31, Palatinat; W. Hope, 16, George-street; A. Gardner, 63, Queen Victoria-street.

RIO DE JANEIRO AND MINAS GERAES RAILWAY COMPANY (Limited).—Capital 1,200,000*l.*, in shares of 20*l.* To acquire a concession for the construction, maintaining, and working a railway in the Brazilian empire. The subscribers (who take one share each) are—S. Ellinger, 60, Queen Victoria-street; W. A. Dawson, 13, Great George-street; A. Tyson, Richmond; E. A. Henley, 70, Mark-lane; S. P. Brooksbank, 1, Chilworth-street; M. M. Brown, 16, Park-street; W. Miller, 60, Queen Victoria-street.

THE LIVERPOOL AND HAMBURG STEAMSHIP COMPANY.—This company is unlimited. The subscribers are—C. Cowan, Edinburgh; A. Currie, Greenock; J. Currie, Leith; J. White, Leith; D. M. Currie, 3 and 4, Fenchurch-street; J. Ferguson, Glasgow; Donald Currie, 3 and 4, Fenchurch-street.

THE WALLSEND COAL COMPANY (Limited).—Capital 5000*l.*, in shares of 5*l.* The purchase and sale of coal and coke of all descriptions, also lime, cement, &c. The subscribers (who take one share each) are—F. C. Dobbing, Chislehurst; A. Watkyns, Fulham; J. J. Herrocks, Leeds; W. F. Taunton, Crouch End; T. H. Garland, Brixton; J. Blackstone, 6, Albert-terrace; W. W. Blackstone, 40, Camden-square.

THE SWADLINCOTE COLLIERY COMPANY (Limited).—Capital 20,000*l.*, in shares of 5*l.* To purchase, in accordance with the terms of an agreement, certain mines and minerals situate at Swadlincote, in Derbyshire, or any other mines and minerals. To work, win, and get coals, minerals, and mineral deposits, and to render them mer-

chantable; and to sell and dispose of the same, and generally to carry on the business of miners, colliery proprietors, and coke manufacturers. The subscribers are—G. Nepley, Swadlincote, colliery manager, 300; W. E. Brook, Clapham, law student, 1; H. S. Foster, 2, Copthall Buildings, accountant, 1; C. Hight, 3, Copthall Buildings, accountant, 1; F. Grant, Islington, clerk, 1; J. Graham, 16, Great James-street, actuary, 1; F. Howard, 3, Copthall Buildings, 1. No Articles of Association have been registered.

GEOLOGICAL SOCIETY OF LONDON.

April 28—ROBERT ETHERIDGE, F.R.S. (President), in the chair.

Rev. Jas. Oliver Bevan, M.A., Russell House, Walmley, Birmingham; Arnold Hague, Washington, U.S.; Augustus Constable Maybury, M.R.C.S., Charlotte-street, Bedford-square; Henry Peter Meaden, Hallgarth-street, Durham; William Peregrine Probert, M.A., LL.D., Cross House, St. Davids, Pembrokeshire, and Hare-court, Temple; and Francis Randell, Corsham, Wilts, were elected Fellows of the Society. Prof. Frederick Guthrie, F.R.S., Science Schools, South Kensington; Rudolf Haesler, Western College, Harrogate; Jas. Hulmes, Bury Hall, Wolverley, Worcestershire; William Jolly, F.R.S.E., Inverness; Charles Myhill, Curzon School House, May Fair; and Alfred George Savile, B.A., Grosvenor School, Nottingham, were proposed as Fellows of the Society.—Rev. Samuel Gasking, Cheetham Hill-road, Stalybridge; Thomas John George, Keyston, near Thrapston; and Cuthbert Chapman Gibbes, M.D., Surbiton Hill, Kingston-on-Thames, will be balloted for as Fellows of the Society.

The following communications were read:—

1.—“Description of parts of the Skeleton of an Anomodont Reptile (*Platypodosaurus robustus*, Ow.) from the Trias of Graaff Reiniet, South Africa,” by Prof. Owen, C.B., F.R.S., F.G.S.

2.—“Note on the Occurrence of a new Species of *Iguanodon* in the Kimmeridge Clay at Cumnor Hurst, three miles west of Oxford,” by Prof. J. Prestwich, M.A., F.R.S., F.G.S.

3.—“On *Iguanodon Prestwichii*, a new Species from the Kimmeridge Clay,” by J. W. Hulke, F.R.S., F.G.S.

The next meeting of the Society will be held on Wednesday, when the following communications will be read:—1. “On the Structure and Affinities of the genus *Protosphongius*, Salter,” by W. J. Solas, M.A., F.G.S.—2. “Note on *Psephophorus polygonus*, von Meyer, a new Type of Chelonian Reptile allied to the Leather-turtles,” by Prof. H. G. Seeley, F.R.S., F.G.S.—3. “A Review of the Family Diastoporidae for the purpose of Classification,” by G. R. Vine: communicated by Prof. Duncan, M.B.Lond., F.R.S., F.G.S.—4. “On Annelid Jaws from the Wenlock and Ludlow Formations of the West of England,” by George Jennings Hindle, F.G.S.—5. “On the occurrence of the Glutton, *Gulo luscus*, Linn., in the Forest Bed of Norfolk” by E. T. Newton, F.G.S.

REPORT FROM CORNWALL.

May 6.—If the tin standards were any longer regarded as of special value in a forecasting sense those who depended upon them would be mightily puzzled by their last vagary. Of course the indications of the London metal market are little better, but everyone knows how for the nonce speculation rules there supreme, while our smelters used to be credited with more business-like characteristics than the hand-to-mouth policy which they have displayed of late. To drop the standards 4*s.* on one Monday, and to put them up again 4*s.* on the Monday following, without any adequate change in the real condition of the market to justify either change is not business-like nor wise, either in their own interests or in those of the mines. We all know that the Cornish smelters are no longer absolute masters of the tin trade, as they once were; but it is idle to talk and act as if they were powerless. They still remain in control, practically, of the tin raised in the county, and have quite as much authority, therefore, as the controllers of the eastern supply, who are practically their sole legitimate competitors now that the supply from Australia has fallen off to such an extent that it can only be made use of to disturb and not to govern the market. We believe that our Cornish smelters are quite strong enough under existing circumstances to set at defiance if they chose the speculative element in the tin market that has been so injurious, but if they intend simply to follow the fluctuations of the Metropolis the time will come very speedily when the miners will at length learn wisdom, and see that they may as well sell in the open market for themselves as submit any longer to the intervention of middle men, who simply reduce the profits of the producer without giving him any corresponding advantage. While the smelters acted as the fly-wheel, and gave steadiness to market operations, they did of course useful general as well as personal work, but they appear to be altogether out of gear now.

Far more instructive lessons have been taught in its way than the comparative indifference with which last week's drop was received. Naturally, it restricted operations in shares, but it had a very small effect upon the reduction of prices, for it was very well known that it was not legitimate. Our own belief is, and it is entertained by many of our best authorities, that with the present statistics and with the present indications of growing trade midsummer will see tin again at as high a figure as it has yet touched for the year. Even to speculation there must come a turn in the tide.

Elsewhere will be found an abstract of the “special rules” proposed to be adopted under the Metalliferous Mines Act to regulate the working of the metal mines within this district. They were drawn up by Dr. Foster, and by him submitted, as already mentioned, to an influential meeting of gentlemen interested in mining, and accepted with very slight alterations.

The working character of the rules are apparent at a glance, even if we had not the endorsement of Dr. Foster himself as their originator, and of the meeting to which they were submitted, which included such thoroughly representative and practical men as Mr. C. Daubuz, Captains Nicholas (West Bassett), S. H. James (Bottallack), Rich, Josiah Thomas, Bryant, James (Duchy Peru), William Skewes, James Bennett (North Levant), William Pascoe, Goldsworthy (Tavistock), John Michell (St. Aubyn United), and Rosewarne (Wheal Sisters), Messrs. R. Boys (Bank, St. Just), Dabb, and Polkinghorne (Phoenix); while Capt. Teague and Capt. Maynard, who were unable to attend, wrote expressing their approval. The rules, therefore, have already had the acceptance of authorities representing half the mining population of the two counties, and in order that the work may be thoroughly done copies are being sent to every mine in Cornwall and Devon for further consideration. Then when all suggestions have been made and duly taken into account the rules will be submitted to the Home Secretary for his approval. The rules have three features which are particularly worthy of notice. They lay down clearly and definitely the way in which explosives shall be used and other dangerous operations carried on, so as to the utmost that human skill can devise to avoid the risk of accidents. This is very important, but still more important in a general sense is the provisions made throughout for the ascertainment and definite fixing of responsibility. There are many matters of course in a mine for which every one engaged therein must in a sense be held responsible, but these are for the most part very apparent. What is most essential is that special responsibilities shall be clearly indicated, and this it will be seen the rules effect from the manager downwards. There is no separate element of danger in any direction which is not put under special supervision, clearly set forth to the person who is held responsible. Where duties are distinctly stated there is of course no excuse for their neglect, and probably there has been no more frequent cause of disaster than the doubt whose business it is to attend to particular things. Moreover, no man is the worse off for a definite understanding of his duties, for he can then concentrate his energies upon that which is essential without troubling himself with other matters. Finally, the governing principle of the whole rules may be found in the words “so far as is reasonably practicable.” It would be quite possible to put mining or any other business operations under such burdensome conditions as would tend to its practical annihilation. This, however, is not the case here, the rules are no more than the safety of life and the preservation of property demand, and provision is made against any undue friction arising from special or casual conditions by this clause of “reasonable practicability.” We regard these “special rules,” therefore, as likely to be of great value, and their introduc-

tion to mark a new era of no little importance in the mining of this district.

This probably, by-the-way, will be one of the last things that Dr. Foster will do in connection with this locality. He has been appointed to North Wales in the room of Mr. T. F. Evans, resigned, and will ere long leave the county. There will only be one feeling alike in Cornwall and Devon, and in every part of his district, and that a feeling of sincere regret at the loss of one who has filled a difficult post so ably—one who has so admirably combined the *savoir faire* and the *fortiter in re*. It is not yet publicly known who his successor will be, but an appointment that would give general satisfaction in the district, and would secure the efficient administration of the Acts, would be that of Mr. J. H. Collins, who now for something like a dozen years has thrown all his energies into the promotion of practical and scientific progress of mining in the West. As to his qualifications there cannot be two opinions, and he has withal a thorough acquaintance with the whole district and its personnel.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

May 6.—The date when the circular of the Earl of Dudley had been looked for, announcing a reduction in the price of coal, has come and gone, and no action has been taken by his lordship; prices of manufacturing coal it is, therefore, assumed will nominally at least remain unaltered during May. The Iron Trade manifests a slight improvement upon the week, alike as regards the demand and the rates quoted. Here and there merchant iron is firmer by from 2s. 6d. to 5s. per ton. Sheets (singles) are 8*l.* 10*s.* to 9*l.* 10*s.*; boiler-plates, 10*l.* 10*s.*; and common bars, 7*l.* Common pigs are likewise stronger, but are without any open market alteration in price.

The miners in South Staffordshire and East Worcestershire have at last determined to put an end to the Birmingham sliding-scale mode of payment as at present existing. Sometime ago they met, but by the casting vote of the Chairman it was decided to retain the present system of regular wages. This week, however, they assembled at Great Bridge, and by 38 votes to 10 resolved to give formal notice to the masters on June 1 for the termination of the scale.

The shareholders of the Hamstead Colliery Company, assembled at their annual meeting, have approved of the scheme of the directors, as sketched in my last week's report, for the providing of additional capital. At the meeting the Chairman said that their undertaking had proved a brilliant success, and Mr. D. Peacock, one of the directors, and who is a mining engineer of much eminence, said that the board only required the additional capital to ensure a complete commercial success. The directors had almost unanimously agreed to double their present stock. On Change in Wolverhampton on Wednesday there was much congratulation expressed at the announcement that it is estimated the colliery will be capable of producing 3000 or 4000 tons weekly for 50 years.

At the recent meeting of the South Staffordshire Mill and Forge Managers' Association a paper was read upon the Patent Hot-air Chamber of Mr. Job Tibbs, of Toll End, Tipton, for the utilisation of dry oxide cinder bottoms in mill and other heating furnaces. The principle is in successful operation at numerous works in this district, as also in Scotland and other iron making centres. It has likewise been patented in America. The chamber is intended to render possible the substitution, with increased economy, of the present obnoxious sand bottom by a cinder bottom. It is claimed that the quality of iron produced is superior, that it can be made at 10*s.* per ton less, and that the yield is increased by between $\frac{1}{2}$ cwt. and 1 cwt. per ton per furnace. High encomiums were pronounced upon the chamber by many of the members.

The colliers employed at the North Staffordshire Coal and Iron Company's pits at Tolke, and at Harecastle and Woodebutts' Colliery, also in North Staffordshire, have turned out on strike against a reduction of 10 per cent. in their wages. About 2500 men are out, and they propose to avail themselves of the funds of the local Union, although the secretary has expressed himself averse to the strike.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

May 6.—A good discovery of lead ore has been made in some shallow trials at Nenadd Llwyd, in the North of Cardigan, a place which is some distance north and east of the cluster of mines in that direction. The wheel and works of the old Bryn-yr-Ayrian Mine are, however, discernible from Nenadd Llwyd, so perhaps, according to the tenor of some mining prospectuses, there may be increased hope for the trial now being made in the latter mining sett. However, I wish the Cwm Dwyfor proprietors who are making it all the success they deserve.

The cheery tone of Capt. A. Francis's (of Wrexham) report from Gwern-y-Mynydd Mine is refreshing, and I trust that this old and extensive mining sett will outstrip all its former production. My best wishes go also with the proprietors of the North Hendre Mine in their new enterprise at the Talacre Mines. Good work has been done at the Roman Gravels Lead Mine during the last year. Still, the amount of profit on the money turned over is not very large. The profits have, of course, been affected by the low price of 1*l.* and possibly some developments have been pushed forward.

The Mold Argoed Colliery, which was closed a few months ago and about 700 men discharged, has been restarted. The Bryn Kinallt Colliery, which has been idle, or nearly so, for a long time, has also been restarted, and is now getting in active work. The proprietors of the new colliery of Plas Power have been fined 5*l.* and costs for keeping their powder store in a dirty state. This is what

in a ravine on our left. This is the "Fridd," where a few good slates have been made, but more work wants to be done before the capabilities of the quarry can be ascertained. A little further on, on the other side of the river, is a quarry further developed, and promising well. This is the Llwyn-y-gwern Quarry, belonging to Mr. Lloyd Jones, of Carnarvon. Another mile and we see the Rhiwgwriddyn Slate Quarry, belonging to a gentleman familiarly known locally as "Jeremiah." This quarry is not worked so much as it has been, but the idleness does not seem due to any intrinsic defects. Turning sharply round to cross a tributary stream, we pass on our right hand the enamelled slate and slab manufactory of Esgair Cyfeiliog, which is at present doing a good trade, and turning out some nicely finished work, the slabs being, of course, derived from the quarries higher up the stream. As we journey the next two miles up the village of Cwrtys we get very deep in political matters. Our driver is an ardent politician, and although he has been busy driving Conservative politicians about the county for the past month, assures us, suiting the action to the word, that he is quite ready to cut off the head of a distinguished chief of that party. So that it is in heated state that we arrive at the inn of Braich Goch, or Red Avon. As we pull up we see along a valley opening out on our right a tip of the Aberllefeni Slate and Slab Quarry, and there sure enough, standing at the junction of the tramroads, is the broad form and strong, good-natured features of Mr. Hughes, the manager. Now, although our Jehu is an intemperate teetotaller, neither I nor Mr. Hughes are, so we are fain to give the horse a rest, ourselves a little rest and refreshment, and the driver a little time to cool, after which we shall resume our journey.

TRADE OF THE TYNE AND WEAR.

May 6.—There is still an amount of dullness perceptible in the general trade of the district; the iron and other trades connected with it share in this lull or depression, and, to a certain extent, it is visible in the coal and coke trades. The steam coal trade in Northumberland is scarcely so brisk as it was a short time ago. Best steam coal has not been sold at less than 10s. per ton; but some of the works have been laid off one or two days per week lately, the demand having fallen off a good deal, and small coal has fallen 6d. per ton. It is expected, however, that this slackness will only be of a temporary character. At the Tyne Docks the shipments of coal and coke continue large. The shipment of fire-bricks and other fire-clay goods is also good. The demand for medium class steam coal has improved, and the pits north of the Wansbeck are doing fairly well. A contract has been made to send coal out to St. Petersburg. The miners in Durham have in some localities lately restricted the output of coal to some extent, and this action of the men has caused some ill feeling between the men and their employers. The question has, however, been submitted to the whole of the members of the Union, and as considerably less than two-thirds of them have voted for restricting the output this will be abandoned, and the common sense course resumed of each man turning out as much work as he can fairly do. The production of iron in the Cleveland and other districts has increased the demand for Durham coke, but the price now received for coke has fallen considerably below what it was a few months ago. A short time since contracts were made by some of the largest firms to supply large quantities of coke at 14s. to 15s. 6d. per ton, and those firms are now getting good profits. The fall in iron has driven down the price of coke some shillings under that of the lowest of those contracts; but, on the whole, there is no doubt that, as a rule, cokemakers are doing well at present. The make of coke is now larger than at any former period. It is estimated on reliable data that the rate of production is now about 5,500,000 tons per annum, and that more than one-half of this is used in the Cleveland district, whilst the remainder is sent to the West Coast and the Midland districts. For some time to come this vast output will be kept up, if not increased.

At the Northern Institute of Mining and Mechanical Engineers' meeting, on Saturday, there was a good attendance of members (Mr. G. C. Greenwell in the chair). Mr. William Logan, of Langley Moor Colliery, read a paper "On Safety Hooks for Winding." The writer showed that although for 20 years safety-hooks had been before the public, yet still a great number of deaths occurred from over-winding in pits. The statistics from 1855 to 1879 gave the number of deaths at 178, or one life lost for 23,373,877 tons of mineral raised, and one for every 64,451 persons employed. Mr. H. Hall, Inspector of Mines in Lancashire, states there is one fatal winding accident in every 9,500,000 of windings. For the purpose of preventing the loss of life and destruction of property, and stoppage of work from over-winding, numerous inventions had been brought to the notice of the public; and for the purpose of inviting discussion the writer described those inventions in detail, and he suggested the appointment of a committee by the Institute for the purpose of investigating this matter. In the course of the discussion which followed the reading of the paper several of the members approved of the suggestion, and a vote of thanks was given to Mr. Logan for his paper. The subject is certainly one of great importance, and it appears to be matter for surprise that those hooks have not been adopted more generally, as the cost is not great, and the action of some of them is so certain and effectual in preventing any loss of life or property when over-winding does occur, and it can scarcely be expected that those cases can always be prevented, as any derangement of the machinery or momentary neglect or absence of mind on the part of the engineer may bring about such a catastrophe at any moment. A paper was also read by Mr. T. Heppell on "Cranston's Rock-Drill," for which he also was awarded a vote of thanks.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

May 6.—There has been very little change in the state of trade at mines and ironworks in Derbyshire, marked quietness being still the rule in some branches. In the lead districts a fair tonnage of ore has been raised, but it is from comparatively few mines, for many produce little more than pays a miner's wages. A moderate tonnage of ironstone continues to be raised, but most of our ironmasters look to Northamptonshire for a large proportion of their supplies, and find that a mixture of that ore with the local produces a good quality of iron. The make of pig has been kept up to the average, but the demand for it has not been so active. This, of course, is the result of the downward tendency of prices, which has been going on for some time, and causes consumers to act with great caution, and to purchase merely for immediate wants. It is, however, evident that prices are likely to come down still lower, and so become more settled. In manufactured iron the business doing is steady, in both mill and foundry material. The Coal Trade is not in a satisfactory state, for production is so greatly in excess of requirements that remunerative prices cannot be obtained, and, in fact, many owners are losing money; still new mines are being opened out in different directions, whilst the consumption does not, for even in London during the first quarter of the present year less was taken than in the corresponding period of 1879. House coal sells slower, and with fine weather there will be a still great diminution in the demand, whilst many economical devices are now adopted that were not thought of until the coal famine, as it was termed, and the famine prices which ruled some seven or eight years ago caused householders to avail themselves of every proposal that was calculated to minimise the consumption of coal. Steam qualities have been in rather better request of late, and the demand is now likely to go on increasing.

In Sheffield trade is still good in almost every branch, and there are the strongest grounds for believing that it will continue in the same healthy state. The heavy branches in particular are well off, most of the mills running night and day. There is a large output of steel rails, prices of which have come down, as was sure to be the case, and this has evidently stimulated railway companies to increase their orders. There will, therefore, be plenty to do in Bessemer rails for a considerable time to come both on home and foreign account. Railway springs are in much better request, and there is also plenty doing in axles, tyres, and wheels in the various works. Crucible steel is in rather brisk request, and the production has greatly increased for almost every description of the manufactured material. Some houses engaged in the production of cutlery are

rather quieter than they have been, but still they are fairly employed in both table and pocket knives. There is more activity with respect to shears for exportation, and the hand forgers have lately been better off than for a considerable time. Ship-plates are in good request, and there is every probability before long some heavy orders will be received for steel-faced plates for vessels of war; in fact, at present a good many are being turned out for our own and other Governments, but the demand for them must greatly increase, seeing that the thick heavy plates are almost entirely discarded. More is being done at the engine and machinery works in the town and neighbourhood, those branches having had a long season of quietness. Crucible steel castings are being largely produced, as are those made of malleable iron at the extensive works of Messrs. John Crowley and Co., the principal establishment of the kind in the kingdom, and where the castings turned out have all the sharpness and finish of steel. There has been some improvement as regards edge tools, whilst file makers are also much busier.

Makers of lawn-mowers and light implements are now doing well, and there is every appearance of a brisk season for harvesting tools. There has been very little change at the foundries, but an increased business is now looked forward to in palesading, stoves, grates, and other castings required by builders. The coal trade of South Yorkshire is still quiet, and the season promises to be anything but a favourable one. House coal does not go off at all well, and sales are only effected at prices which leave no profit whatever, but at many places lead to a loss. Steam coal has been selling well, but there is the great difficulty with respect to it previously pointed out, that to sell all that is required would lead to the soft or household coal being thrown down and greatly depreciated in price by the weather and other influences. Makers of coke have been doing a steady trade with Sheffield and North Lincolnshire, and more ovens are now being erected in the district.

STARTING THE ENGINE AT EAST CREBOR MINE.

May 1 witnessed the successful starting of the splendid engine at this mine, which has been specially manufactured by the eminent firm of engineers, Messrs. Robey and Co., of Lincoln, for the double purpose of pumping and hauling. More than ordinary interest attached to the proceedings from the circumstance that this is the first engine of this complete type ever introduced into the metalliferous mining districts of the West of England. The engine is nominally of 50-horse power, calculated at a pressure of 40 lbs. in the boiler, and is so designated; but this is rather misleading, as the capacity of the engine is such that working at its ordinary pressure its useful effect is fully equal to a 50-in. cylinder engine of the old Cornish type. The essential difference in the construction of the Robey engine and the old Boulton and Watt engine is that the former is non-condensing, and employs high-pressure steam worked expansively, feed water heated to 100°, and other economical arrangements. Messrs. Robey and Co. have never hitherto been able to introduce their engine for pumping purposes into Cornwall or Devon, owing to local prejudices on the part of engineers and mine agents, and credit is justly due to Mr. H. L. Phillips, one of the largest shareholders and the Chairman of the company, for having recognised the merits of the Robey engine and introduced it under such conditions as are calculated to make it better understood and appreciated.

Among the company present at dinner were Mr. H. Gutierrez, of London, Mr. T. Rosewarne, Mr. Wm. Cripe, Capt. George Rowe, Mr. J. Rosewarne, Mr. Skinner, of Gunnislake, and several others. Mr. H. L. PHILLIPS presided.

After the usual loyal toasts, the CHAIRMAN said that he would ask them to drink "Success to East Wheal Crebor." They had witnessed that day the starting of the engine which, he believed, was going to enable them to lay open a large amount of mineral wealth. The property was situated on the same run of lodes as that of Wheal Crebor, which he considered was destined to become a very important mine, and it was well known that East Crebor had, in comparatively superficial workings, produced some of the richest copper ore ever sold in the county; and further, that as soon as the mine was drained one would be at once brought to surface. It was reported that considerable quantities of copper were now lying already broken in the 60 fm. level, as the tutwork men had not time to send up their ore when the water was let into the mine many years ago; and from conversation he had had with some of the former men there could be no doubt they had an excellent mine. As to the engine which they had formally started that day, it was a splendid machine, and reflected great credit upon the eminent firm who had constructed it. He regretted the absence of Mr. Clench, the acting partner, who was unavoidably away, as he had taken so much interest in working out the details of the construction, and he might here incidentally mention that the engine not only pumped the water, but hauled the stuff and did all the capstaning, and it was contemplated to make it drive the crusher for the copper ore, as well as to drive a sawing-machine to cut up all their timber. (Cheers.)

Capt. ROWE, in returning thanks, said he was proud to be the manager of so promising a mine as East Crebor, and he was delighted with their engine. Already they had drained the mine 25 fms. below the adit level, and the only trouble was that they could not follow the work of the engine quite so rapidly as they wished, for it really performed its own functions too fast for them. But this was a fault on the right side, and he was charmed with what it was doing. As to the mine, it was only necessary to look at its position to recognise its excellent prospects, and he fully believed they would speedily have in East Crebor such results as would be gratifying to all concerned.

The CHAIRMAN said that one of the essentials to success in all industrial enterprises was a strong proprietary, and this was especially the case in East Crebor Mine. There were nearly 150 shareholders in the concern, and everyone of them persons of wealth and respectability, and many of them representative men. They were glad to see with them to-day a gentleman who, with his friends, was largely interested in their mine, and he would ask them to drink to the healths of the shareholders, coupling with the toast the name of Mr. Henry Gutierrez. (Cheers.)

Mr. GUTIERREZ thanked the company for the honour they had paid him, and took the opportunity of thanking their Chairman for having brought before their notice so *bona fide* a concern as East Crebor, the shares in which were all subscribed for in less than a quarter of an hour. He thought that the public should be reminded of this, for it was a great mistake to bring out mines in large numbers of shares—tens of thousands of shares in many instances—and then to care less about the mine than selling the shares to an indiscriminating public. In reference to what had been said about East Crebor, he would mention that he had seen a letter addressed to one of the largest dealers in the Stock Exchange by the pitman who had last worked in the mine, and who was now at mine in Wales, and he fully confirmed the observations and opinions which were current.

The next toast proposed was "The Neighbouring Mines," to which Mr. SKINNER, the purser of Gunnislake Mine responded, and also the MANAGER of West Devon Consols. The former stated that it was gratifying to see gentlemen from London coming into their neighbourhood and taking up such good mines, and introducing them in so highly creditable a manner as was the case in this instance, and he believed it was impossible, with the judicious expenditure of capital in connection with well selected properties, to obtain other than success. He had heard a good deal of West Devon Consols, which was a near neighbour of Gunnislake Mine, and he believed it would make a stir in the mining world.—The MANAGER of West Devon Great Consols, in responding, said they had just discovered in that mine as handsome a lode as had been opened upon for 50 years in that district. It was in a splendid channel of ground, backed up by the granite, intersected by cross-courses; and this was not all, for they had five lodes in their property, and these had been so successful in their neighbour Devon Great Consols as to have made the 17. shares worth 800*l.* each. The north part of their property had been commenced by Capt. James Richards, the manager of Devon Consols, and some 30,000*l.* or more spent there, and by-and-by this would be made available, but they had now discovered a lode far superior to anything else in the mine, with a gossan back and spots of ore right up to surface. Never a pick had been thrown in it, to use a

miner's phrase, and it was all in virgin ground. It was bound to lead to a course of ore, and the shareholders might any moment be informed of a very great and surprising discovery. (Hear.)

The "Trade and Prosperity of Tavistock" was next proposed, and responded to by Mr. CRIPER, who in the course of a most interesting speech said he had been for the last 30 years acquainted with the mines of that district, and had opportunities for recognising the importance to their town of success in mining. When Devon Consols was giving 70,000*l.* in dividends every year Tavistock was a very thriving town, and although these enormous results were now diminished, yet the work which had been accomplished had given data of the utmost importance to observing minds, and would lead to other great successes. He had often heard of the riches of Old Crowndale, which it was said had given a quarter of a million profits to, and had made the fortunes of Sims, Willyams, and Co. This adjoined East Crebor; and again, Old Crebor gave 180,000*l.* in dividends. Then there had the present successful mine of Crebor, and in East Crebor they had a most promising stratification, known as valuable lodes to work upon, and, in fact, all the important elements of a great success. Nor was this the only promising mine, for going on to other ground, he meant West Devon Consols, he had an equally high opinion of that. In his early days it was called Tincroft, and strange to say, it was the very first mine in which he took shares—now 30 years ago; but nothing was done but to scratch about the surface, and then the property got locked up, and could not be obtained. He did not know of a mine which offered such prospects as West Devon Great Consols, and this was also the opinion of the late Capt. James Richards, who had often expressed the hope to him that he might live to see the junction of the lodes they most undoubtedly possessed, and now that they had discovered a new lode with a splendid gossan he was reminded that—

As there was no fruit without blossom,
There was no rich copper lode without gossan.

Mr. Cripe concluded by saying that he knew of no such district as Tavistock for the employment of capital; but without man's industry their riches must lie undeveloped. He could not understand why people went abroad to seek mines when they had such splendid opportunities at home, unless it were, as Campbell said—

Distance lends enchantment to the view.

But he hoped that the good work they had that day inaugurated would tend to make their district better known and appreciated. Before sitting down he wished to propose the health of Mr. Rosewarne, whose special knowledge of this district, derived from a close and practical acquaintance with their mines for 40 years, gave him exceptional facilities, and consequently his friends and those associated with him exceptional opportunities.

Mr. ROSEWARNE briefly returned thanks, and expressed sincere pleasure in seeing so many old friends around him. Mining was capable of great results, and he hoped to be spared to see East Crebor and West Devon Consols great successes. (Hear.)

Mr. GUTIERREZ had pleasure in proposing the health of their excellent Chairman, who he knew had the interests at heart of all associated with him. Not only was Mr. Phillips a theoretical man, but he was eminently a practical one, and his determination to introduce the engine they had got at East Crebor, in spite of the ill-natured remarks of those who ought to know better, was a proof of what he could carry out. He had a great opinion of East Crebor and West Devon Consols, nor was it possible to feel otherwise, and it was a great matter to know that the executive was competent and had the entire confidence of the proprietors.

The CHAIRMAN briefly acknowledged the toast, and the proceedings terminated.

CARDIGANSHIRE MINES.—The fall in the price of ore has acted as a check upon the revival which had set in, but doubtless this is only temporary, as there is every probability, as foreshadowed by Mr. Peter Watson and others, that the price of lead ore will rise to the extent of at least 3*l.* or 4*l.*—to, say, 19*l.* or 20*l.* per ton. It is rumoured that Goginan Mine will shortly be started with a fresh capital, and there is no doubt that this grand old mine is still as rich as ever. The old Allt-y-Crib Mine, after many vicissitudes, is again in liquidation. This mine has never been sunk in depth, and a spirited trial in that direction would, in all probability, lead to satisfactory results. A fine discovery of ore took place some time back at Camdwrbach, and a deep cross-cut started to cut the lode in depth has within the last few days reached the lode, and laid open a very fine course of ore, which is worth at least $\frac{1}{2}$ ton per fathom. A few fathoms further west is situated the old Camdwrbach Mawr Mine, which proved some years back to be very rich for copper and lead, now about to be started in conjunction with the eastern ground as a company, and no doubt this will have a successful enterprise. To the north the Cambrian Mines continue to turn out rich copper ore. Blaen Caerlan Mine also continues to open up satisfactorily. Further south Frongoch and the Lisburnes are as rich as ever, these wonderful mines having paid back their original capital upwards of 30 times. Grogwinion and South Darren also continue dividend paying. There are many other mines in this county well worthy of capital and equally likely to produce rich returns if not overburdened with capital, and worked with judgment. Those named must not be taken as a complete list, as there are many others, such as Bwlch, Bronfloyd, Cwmystwyth, Caron, Monydd Gorddu, Vaughan, Ystwyth, and others, beside many promising sets only requiring capital to convert them to dividend mines.

CHEAP MINE BUILDINGS.—A method of moulding concrete blocks, which might be turned to good account in the construction of cheap buildings about mines, has been invented by Messrs. BRADBURY and GOODISON, of Birkenhead. The moulds or boxes used may be made of wood, metal, or other suitable material, and are preferably made in pieces, so that they can be readily taken apart; this is important, as by this means they can save much valuable time by taking the mould to pieces immediately after casting if required. They take as many sides of the box as necessary, and on these they fasten loops or fasteners (usually of metal), which are generally made of small pieces of hoop iron secured by nailing or otherwise to the wood, and raised from it at the centre so as to form a loop; sometimes they simply drive in flat headed nails leaving the heads standing out from the wood. A pattern of the desired shape is then placed in position, and a composition consisting of plaster of Paris mixed with Portland or other similar cement, and sufficient water to make them plastic run round the pattern; this takes hold of the loops on the wood, and thus firmly secured to it, while the other side of it forms a portion of the mould. It will be seen that by altering the shape of the wooden box and the number of its sides the mould may be divided into as many different portions or sections, each attached to its respective side. After being run these sections are dressed to the proper fit with the others, and when put together form the complete mould. If metal is used to make the mould, they prefer to make the side of the box and the section of the mould in one, so that after suitable fitting when put together the sides will form the mould within them. For moulding ornamental bricks and the like, one or more sides may be ornamented and the rest left plain. The mechanism to which the moulds are attached may be so arranged as to reverse the mould on to a board, and the bottom of the mould now become the top is removed, then the sides unhooked and withdrawn leaving the casting entire. When blocks for buildings are to be made, they prefer to form the centre part of common materials, such as broken stone concreted together by cement or other binding material, and the outside of ground stone or sand mixed with cement or other binding material so as to form a substantial block with a good exterior surface; this may be done by lining the sides of the moulds with the fine materials and filling in with the commoner sort.

HOLLOWAY'S OINTMENT.—Sores, wounds, ulcerations, and other diseases affecting the skin, are amenable by this cooling and healing unguent. It has called forth the loudest praise from persons who have suffered for years with bad legs, abscesses, and chronic ulcers, after all hope of cure has passed away. None but those who have experienced the soothing effect of this ointment can form an idea of the comfort it bestows, by restraining inflammation and allaying the pain. Whenever this ointment has been once used it has established its own worth, and has again been eagerly sought for as the easiest and safest remedy for ulcerous complaints. In neuralgia, rheumatism, and gout, the same application properly used, gives wonderful relief.

Lectures on Practical Mining in Germany.

GLAUSTHAL MINING SCHOOL NOTES*—NO. CXLXI.

BY J. CLARK JEFFERSON, A.R.S.M., W.H. SC.,
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(Formerly Student at the Royal Bergakademie, Clausthal.)

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OLEFIANT GAS.—Heavy carburetted hydrogen, consisting of one volume of carbon and two volumes of hydrogen, is found sometimes, though very seldom, in coal mines. Bischoff has discovered it in small quantities in some of the Saarbrücken coal mines. It is sometimes met with in larger quantities in brown coal mines. A mixture with air explodes more violently and at a lower temperature than light carburetted hydrogen and air; hence when its presence is suspected safety lamps with a gauze of finer mesh should be used. According to some authorities it is poisonous when breathed in only small quantities, and according to others it is simply a non-supporter of life, and can be breathed without danger when sufficiently diluted with atmospheric air. A mixture with air ignites at a light red heat; one volume of olefiant gas requiring three volumes of oxygen, or 15 volumes of air, for complete combustion, when the explosion is very violent.

CARBONIC ACID.—Black damp, choke damp, stythe, after damp. This gas is composed of two volumes of oxygen and one volume of carbon, condensed to two volumes of carbonic acid. Under atmospheric temperatures and pressures it is a colourless transparent gas, perfectly odorous, but when subjected to great pressure it becomes condensed to a transparent colourless liquid. This gas is more than half as heavy again as air, its specific gravity being 1.529. At 0° C and under the ordinary atmospheric pressure, 1000 cubic feet of this gas weigh 123 lbs., and on account of its density it may easily be collected in dry vessels by displacement, and may be poured from one vessel into another, like water.

It is produced in considerable quantities by the respiration of men and animals, the proportion respired varying, as we have seen, from 3 to 4 per cent.; also by combustion, and the decaying of animal and vegetable substances, and in these cases it remains, in consequence of the property of diffusion, generally diffused in the whole of the surrounding air. It occurs chiefly in old goafs and in workings to the dip, which may be partly filled with water. It is sometimes found in some of the Scotch coal mines, where light carburetted hydrogen is scarce. It has been met with more or less in all strata, whilst driving the Reinhold Foster adit at Eiserfeld, whilst driving a cross-cut in the salt mine near Stettin in Hohenzollern, in the Pontgibaud lead mine in the Puy de Dome, where much difficulty occurs in removing it. In this mine on first starting the pumps the pressure of the gas with which the water was impregnated was sufficient on being liberated by agitation to raise a column of water several yards in height. According to Kuborn the intermingling of carbonic acid with the air in levels depends upon the temperature and strength of the current, in warm summer days and by stormy weather the layer of carbonic acid rises; in cool nights, and with only a moderate current, the carbonic acid sinks to the floor of the level.

When limestones are heated, as in the process of lime burning, the carbonic acid is expelled, and escapes in large volumes. By the operation of underground heat upon limestones in volcanic districts large volumes of carbonic acid are continually finding their way into the atmosphere, impregnating the underground waters (which under ordinary atmospheric pressure absorb an equal volume of gas), from which it is disengaged by agitation. This is probably the explanation of the issue of gas at the Dunsthöhle, near Pyromont, and the Grotto del Cane, near Naples. Carbonic acid, which is met with in spring waters, may be due to percolation through limestones or other strata in which this gas is given off; in many cases it is derived from the gradual oxidation of the vegetable or other organic matter which the water holds in solution, by the action of the air which all waters naturally contain. It is from this cause that carbonic acid is met with in such quantities in brown coal mines, where it plays a part very similar to that of light carburetted hydrogen in fiery coal mines, in which also disengagements of carbonic acid occur.

Where carbonic acid is very plentifully disengaged, and there is only a slight current, diffusion takes place so slowly that the carbonic acid ranges itself in a layer according to its specific gravity at the lowest places, and is often very sharply divided from the lighter air which floats upon it, along a horizontal plane, where the diffusion of the two gases into one another takes place. On this account old workings, abandoned shafts and drifts in mines, which have an outlet on their upper or rise side, should be entered with the greatest caution. If it is an old shaft that has to be entered, a light should be first lowered; should this burn clearly the well or shaft can be safely descended. Should the light go out it should be endeavoured to cause the gas and air to mix by agitation, by means of quickly raising and lowering bundles of brushwood or straw attached to a cord. In no case should the shaft be descended until a lighted candle has been found to burn steadily. In the case of dip roads the gas may be removed by throwing in a jet of water or lime water amongst the gas, which is thus absorbed; or better, the gas may be removed by carrying a strong air current into the roads by means of a brattice partition in the level. High pressure steam is also a very successful agent for removing carbonic acid.

Carbonic acid when it occurs in dangerous excess in the air of mines is called black damp, or choke damp; that which is formed as the result of an explosion is termed afterdamp.

As we have before mentioned, the atmosphere contains usually 0.4 per cent. of carbonic acid, an excess of 2 per cent. begins to exercise an injurious effect, and air containing 1 per cent. is decidedly bad. In a report by Angus Smith on the air of mines he gives us the percentage amount of carbonic acid in the air of Manchester—0.4 per cent., .06 per cent., in open spaces in London .03 per cent., in the Strand Theatre 1 per cent., in close buildings .16 per cent., and in the mines of Aileen Head 2.73 per cent. In some of the Cornish mines the carbonic acid has been found to amount to 2 per cent. When the atmosphere contains from 5 to 6 per cent. of carbonic acid a light burns only with difficulty in it; and with 10 per cent. lights are completely extinguished; with 8 per cent. it cannot be breathed without danger; and with 5 per cent., although not dangerous, an injurious influence is exercised if it is continually breathed. According to Pfahler, when the air of a mine contains 5 per cent. in volume the wick of a candle or lamp gives only a weak glimmer, with 8 per cent. the light is immediately extinguished, and with 8 to 10 per cent. it is irrespirable. It appears to act as poison in a very short time, the resulting asphyxia being proceeded only by slight pains in the head and eyes. People who have fallen into a state of unconsciousness from breathing this gas are very difficult to revive, and the attempt is only successful when they have not remained long in such an atmosphere. The presence of carbonic acid in mines is generally accompanied by an excess of nitrogen, on account of the oxygen being taken up in the formation of carbonic acid. In estimating the limit in which life is possible in mines where part of the oxygen has been taken up in the formation of carbonic acid, an excess in the air of 3 per cent. of nitrogen and 4 per cent. of carbonic acid will produce suffocation, which requires from 8 to 10 per cent. of carbonic acid, when there is no excess of nitrogen.

According to Miller carbonic acid gas in its concentrated form is irrespirable, for by producing spasm of the glottis it is prevented from entering the lungs; when diluted with air, however, it may be breathed without a suspicion of its presence. If the proportion exceeds 3 to 4 per cent. of the air it acts as a narcotic poison, and even in very much smaller quantities its depressing effects are very injurious.

CARBONIC OXIDE.—When carbon burns with a limited supply of oxygen carbonic oxide is formed. It consists of one volume of oxygen and one volume of carbon, condensed to one volume of car-

bonic oxide. Its production can often be observed in an ordinary red hot coal fire. The oxygen of the air which enters at the bottom of the grate combines with the carbon of the coal, forming carbonic acid, the latter then passing upwards over the red hot coals parts with half its oxygen to the red hot carbon, forming thus carbonic oxide, which on coming out at the top of the fire meets with the oxygen of the air, and burns with the well known blue lambent flame forming carbonic acid. It is a transparent colourless gas, with a faint oppressive odour. It is a little lighter than air, its specific gravity being .97; 1000 cubic feet of this gas weighing 79.5 lbs. When breathed, even though diluted with air, it acts as a direct poison, and it is so much the more dangerous because those who breathe it cannot detect its presence, and soon become unconscious, and death ensues from suffocation. According to Dumaz and Leblanc 1 per cent. of carbonic oxide in the air has a fatal effect, and in an experiment by the latter a large dog was asphyxiated in an atmosphere containing 4 per cent. of carbonic acid and 1 per cent. of carbonic oxide, and these are mixtures in which a light will still burn. Carbonic oxide when breathed converts the arterial blood with which it comes into contact into venous blood; when the quantity is only small it produces a sensation of oppression and tightness in the head, stupefaction, and giddiness. This gas is produced in small quantities during the process of fire setting, and in still larger quantities when a coal pit takes fire.

The German miners have given the name "Kehlendunst" to an atmosphere containing carbonic oxide, carbonic acid, and light carburetted hydrogen, which is generally the result of an underground fire (either of the woodwork or of the coal itself), in which the products of combustion are not such highly oxidised compounds as would result from a fire at the surface with free access of air. A fatal accident due to the presence of such an atmosphere took place in November, 1869, in the mine Bully-Grenay, Department Pas-de-Calais, where 19 lives were sacrificed, including the mine manager.

In most explanations of the chemical phenomena of an explosion of the resulting gases in the atmosphere it is generally assumed where the proportion of air to marsh gas exceeds 10 to 1 that the resulting gases are nitrogen, oxygen, carbonic acid, and steam, and where the proportion of air to gas falls below the above before explosion that the resulting gases after the explosion are nitrogen, carbonic acid, light carburetted hydrogen, and steam; this supposes that the affinities of the gases remain the same for all conditions. According to recent experiments by Mr. J. W. Thomas, of Swansea, when carburetted hydrogen is ignited in a mine with four or five times its volume of air only 10 per cent. of the carbon is converted into carbonic acid, and 90 per cent. into carbonic oxide. When the proportion of oxygen does not exceed one-half the volume of the marsh gas no hydrogen is consumed, the resulting gases being carbonic oxide and hydrogen. This is the opposite of what has been generally assumed that in all cases of explosion the affinity of the hydrogen for oxygen is greater than that of the carbon for the oxygen. With a mixture of 10 volumes of marsh gas and 17 volumes of oxygen some of the hydrogen is converted into water, and all the carbon into carbonic oxide and carbonic acid. When mixed with five times its volume of air the carbon forms 13 per cent. carbonic acid and 87 per cent. carbonic oxide. With six times its volume of air the proportion of carbonic oxide is four times that of carbonic acid, and with an increase in the volume of air the per cent. of carbonic oxide decreases, until when the theoretical proportion (nine and a-half volumes of air and one volume of gas) required for complete combustion is reached only carbonic acid and water are formed. It seems probable, therefore, that the after-damp from all explosions contains at least 3 per cent. of carbonic oxide. That some of the deaths resulting from an explosion are due to carbonic oxide in the after-damp seems to be proved by the fact that close to the bodies of the victims the lamp has been found burning brightly, and as it generally requires 2 or 3 more per cent. of carbonic acid in the atmosphere to produce suffocation than to extinguish lights it appears improbable that in these cases death has resulted from carbonic acid. Another fact which strongly confirms the supposition that many of the victims of an explosion owe their death to breathing carbonic oxide is the life-like expression of the countenance and the posture of the body, which seems to have been that in which they were overtaken by the deadly blast, one breath of which has instantly passed the body into a state of coma.

FOREIGN MINING AND METALLURGY.

Prices of Iron are relatively low upon the Belgian markets, but they have at the same time been supported with a tolerable amount of firmness. Steel has been pretty well maintained in Belgium. The Austrian iron trade has followed the English markets, and prices have shown a marked downward tendency.

The crisis through which the Belgian Coal trade has been passing appears to have sustained a check. Prices, after having been almost continually drooping for several weeks, have now once again shown a firmer tendency. Some rather important coal contracts are stated to have been concluded of late in Belgium. The Austrian coal markets have shown a slight depression, and rates are lower than they were a month since. Notwithstanding this, quotations still exhibit an advance upon the rates current in the spring of last year, and hopes are entertained that a firmer tendency will prevail. Quotations for coal in Germany have been maintained with tolerable firmness. The daily deliveries from the Ruhr basin in the first half of April averaged 55,715 tons, as compared with 50,980 tons in the corresponding period of 1879.

The Paris coal trade has been in rather an uncertain state, and prices have been maintained with some difficulty. English coal appears to be competing more and more with French and Belgian coal upon the French markets. We learn, nevertheless, that the Anzin Company has been renewing coal contracts at 19s. 2d. per ton.

Quotations for rough pig have been, to a large extent, nominal at St. Dizier. Meurthe-et-Moselle pig has been offered at 34.12s. per ton. Pig for recasting has sustain considerable competition from English pig, which now costs 34.18s. to 44. per ton in the Champagne group, all duties and expenses paid. Rolled iron from coke-made pig has been quoted at St. Dizier at 10l. per ton; mixed iron at 10l. 16s. per ton; puddled charcoal-made iron at 11l. 4s. to 11l. 12s.; and mixed machine iron at 10l. 16s. to 11l. per ton. According to statistics collected by the Committee of French Forgemasters, the aggregate imports of iron and steel from France in the first quarter of this year amounted to 61,880 tons, against 54,612 tons in the corresponding period of 1879. The augmentation in the imports this year will be seen to have been 7267 tons, or more than 13 per cent. The exports of iron and steel from France in the first quarter of this year amounted to 38,836 tons, as compared with 34,110 tons in the corresponding period of 1879, showing an augmentation of 4390 tons, or about 12 per cent., this year. The exports of iron minerals from France in the first quarter of this year increased 4176 tons, or about 30 per cent. The imports of iron minerals into France in the first quarter of this year increased 4760 tons, or about 2 per cent. There has been no change in the price of iron upon the Paris market. At a recent meeting of forgemasters of the Nord held at Valenciennes, it was decided that an effort should be made to maintain quotations for merchant iron. This course was adopted, because it was considered that the two basins of the Escant and the Sambre were well off for orders.

In consequence of the drooping tone of the advices received from England, the United States, Belgium, &c., most descriptions of iron have given way upon the German markets. Plates have alone been maintained; prices of some descriptions of this class of iron have, indeed, slightly advanced. Bessemer steel rails have been tolerably firm in Germany, but iron rails have experienced a rather serious fall. New orders are somewhat scarce, but the works are still pretty well occupied. The Upper Silesian Railway Company has given out orders for locomotives and tenders upon the German markets to the amount of nearly 35,000t. The Upper Italy Railway Company has let contracts for 55 turn-tables. The tenders sent in showed that proprietors of some works are contenting themselves with moderate profits in order to assure employment to their staffs.

From Huelva we learn that the exportation of copper has greatly increased, and owing to the demand for iron the Rio Tinto Company have

been enabled to utilise the almost inexhaustible deposits of iron ore in that district. The demand for manganese for the manufacture of steel has also contributed greatly to the prosperity of Huelva. This mineral is abundant in the province, and there are about 30 or 40 mines, some of which are only imperfectly worked. Considerable interest is at present being shown in connection with a proposal by a firm in Huelva for the construction of a railway from that place to Zafra, on the Portuguese frontier.

SHORT NOTICES ON IRISH MINES.*

BY WILLIAM THOMAS.

To the east of Cappagh Mine is the Ballydehob River, and Kilcoo is on the eastern side of the river. The great lodes of the district run through the Kilcoo Mine, and some years ago a slight trial was made on one of them near a large cross-course. It was a very fine large lode, consisting of gossan, soft friable quartz, yellow copper ore, black oxide of copper, &c. A small engine was erected, but it was not of sufficient power to keep the shaft dry, and the trial was abandoned. Several tons of good copper ore were raised from this slight trial. Kilcoo Mine is well situated, being close to an inlet or creek of Roaring Water Bay, and, if properly worked, judging from indications, would make a good mine. The owners are or were the Irish Church Commissioners. To the east of Kilcoo, on the same run of lodes, is Roaring Water Mine, which is situated on a sheltered creek of Roaring Water Bay, and commanded by water-power for pumping, hauling, &c. Superficial trials were made as far back as 1844, and several large lodes discovered, containing gossan, quartz, and grey and copper ore of high percentage. A late company sunk a perpendicular shaft about 40 fms., and carried out other works; but for want of funds suspended operations when they were near reaching an important object. The owner of the property is Mr. George Long. A small amount of capital would, no doubt, do good in this mine. To the south, and parallel with Coosheen, Ballycummisk, and Cappagh Mines, a run of copper lodes passes through Coney Island, Long Island, and Horse Island. Trials of a superficial character were made in Coney Island and Long Island some years ago, and rich grey ore and carbonate of copper raised. A shaft was also sunk in Castle Island some 10 or 12 fms. deep on a lode which produced remarkably rich grey, purple, and yellow copper ore? Horse Island is the most easterly of the islands, and is situated in Roaring Water Bay. In 1834 an Act of Parliament was obtained to encourage the working of mines and quarries in Ireland, and to regulate a joint-stock company for that purpose, to be called the West Cork Mining Company. The directors of the said company agreed to pay Lord Audley, the then proprietor, the sum of 165,000*l.* for a lease for 61 years of the said mines of Cappagh, Ballycummisk, and Horse Island, and quarries on the Audley estate, and did actually pay on account of the said lease the sum of 115,000*l.* A shaft was sunk on the course of one of the lodes in Horse Island 30 fms. deep by the West Cork Company, which produced about 3000*t.* worth of rich copper ore. The said company never forked the water out of Cappagh Mine. Since then surface trials have been made on different parts of the island, and rich ore discovered in lodes of a very promising character, which if properly worked, judging from the past and present prospects and indications, would lead to profitable results. The owners of Horse Island are Mr. and Mrs. McCarthy Collins.

[In "Short Notices" on Coosheen Mine—"there being a bunch of eight parallel lodes" should have been "a belt of eight parallel lodes."]

PANT-Y-MWYN LEAD MINE.—On Tuesday last the directors with a few shareholders and friends met at Mold for the purpose of visiting this mine to witness the working of the new Robey Engine just erected. The weather, though somewhat threatening, fortunately proved favourable, and after a pleasant drive of three miles the party spent several hours in going over the mine and examining the new engine and other surface works, with all of which they were well pleased. Of course the new engine and machinery were the chief objects of attraction, and the expressions of warm admiration at the splendid way in which they performed their work were universal. The party returned to Mold by 3 p.m., and after partaking of a substantial repast, the Chairman, Dr. Lambe, of Liverpool, gave a short sketch of the past history of the mine, and its present position and prospects. Mr. J. Nancarrow, of Liverpool, who stated he had been a miner for 58 years, and who has had charge of various mines both in this and other countries, said it was to his mind a certainty, now they had this new and powerful machinery, that within a short time the present output would be considerably increased, and that in 12 months from the present time he had no doubt they would be having returns of 100 tons a month. Mr. James Yelland, of Shrewsbury, stated he had been connected with mines all his life, and that he could not only confirm all that Mr. Nancarrow had said, but thought he had really understated the case. This mine had great advantages over many other good mines, which contained plenty of ore, but in hard ground costly to work, and in which the stone and ore together had to be crushed before the ore could be separated. Fortunately in this mine there was not only plenty of ore, but it was in soft ground easy to work, and they could dress the ore at a very moderate cost. There was not the least doubt about the mine being a splendid one, and as they had now this powerful machinery, and in Capt. Parry a first-class agent, whom he had known for many years, he was confident the company had a very happy and prosperous future before them. Capt. Parry next said the lode was a very wide one, and there was no doubt it was the master lode of the district. The ground was everything that could be wished, and he would be very much mistaken and surprised if they did not very soon come upon some great body of ore. In all his experience he had never seen a lode equal in every respect to the one in which they were now working. Mr. Hayward (who represented Messes. Robey and Co., of Lincoln) stated that he was very pleased with what he had seen, and there was no doubt the engine they had just erected would do all the work they could possibly require of it for many years to come.

DOLFAWR MINE (Cardiganshire).—This property has been started as a company, most of the capital having been taken up privately. A new lode was recently discovered, parallel to the old lode, which proved so rich; the appearances are very promising, and it is to give this a further trial that a limited capital has been raised, sufficient being reserved for dressing machinery. Should the trial prove to be successful, as there is every reason to expect it will, in which event very large returns would be made on so small a capital—2000*t.*, we believe; but the Lisburne Mines, on a capital of 7000*l.*, have returned to the present company over a quarter of a million. We can only wish the new venture, which is managed by respectable local parties, every success.

CORNISH PUMPING-ENGINES.—The number of pumping-engines reported for March is 16. They have consumed 1626 tons of coal, and lifted 12.1 million tons of water 10 fms. high. The average duty of the whole is, therefore, 50,300,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:

Card Brea—76 in.	Millions	52.9
Dolcoath—85 in.		61.4
Mellanear—Gundry's 80 in.		52.6
West Basset—Greenville's 70 in.		53.2
West Basset—Thomas's 60 in.		56.8
West Wheal Seton—Harvey's 85 in.		60.9
West Wheal Eton—Rule's 70 in.		62.0

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* These "Short Notices" I venture to hope will direct the attention of English capitalists to the run of mines from Browhead to Roaring Water. A short description of other mining districts will probably soon follow.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath Dr. von Groddeck, Director of the Royal Bergakademie, Clausthal, The Harz North Germany.

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Surveys.

Printed and published by WILLIAM POLLARD, Exeter; and sold by POTTE
and Son, Royal Exchange, London, and all booksellers.

GEOLOGY.—In the Preface to the Student's Elements of
Geology, by Sir CHARLES LYELL, price 9s., he says—"As it is impossible
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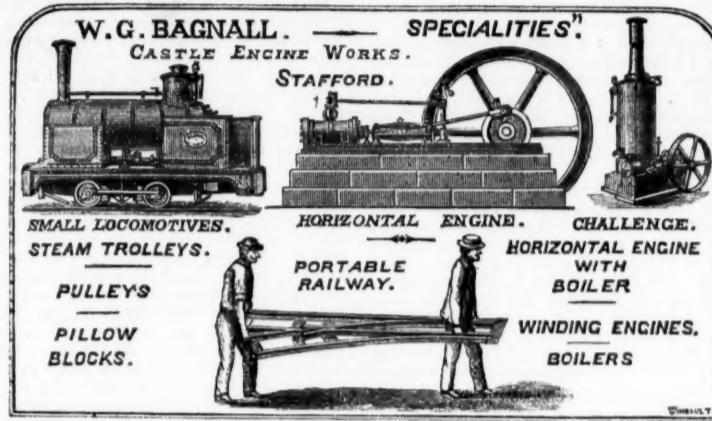
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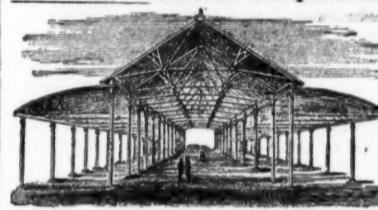
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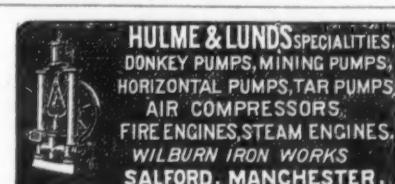
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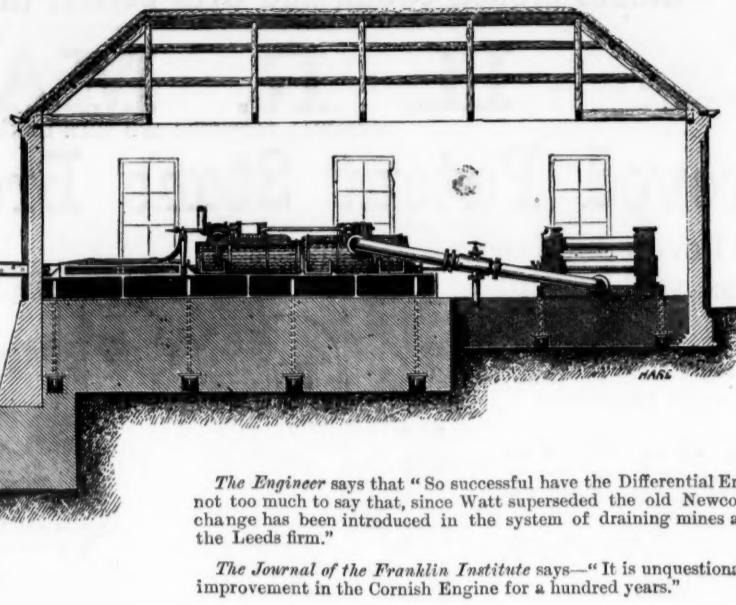
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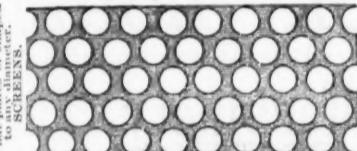
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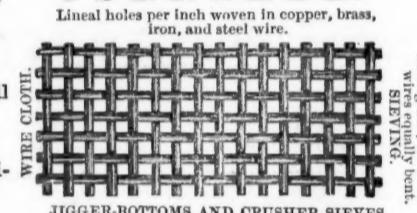


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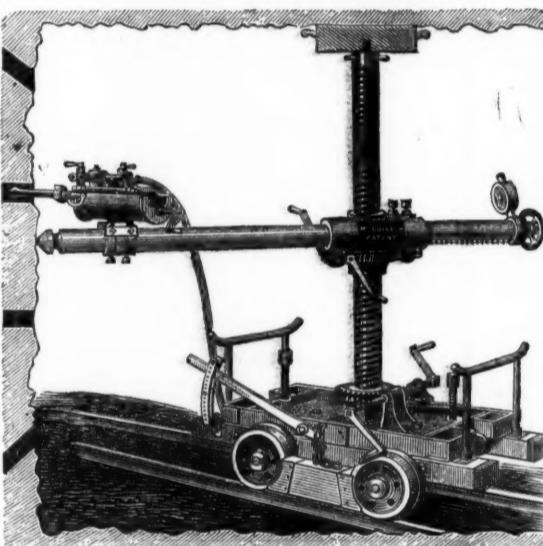
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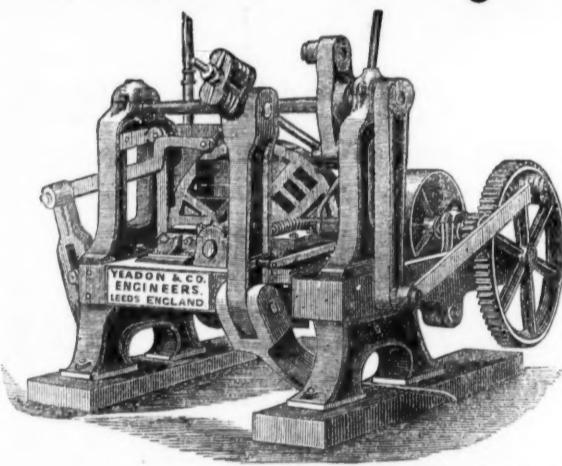
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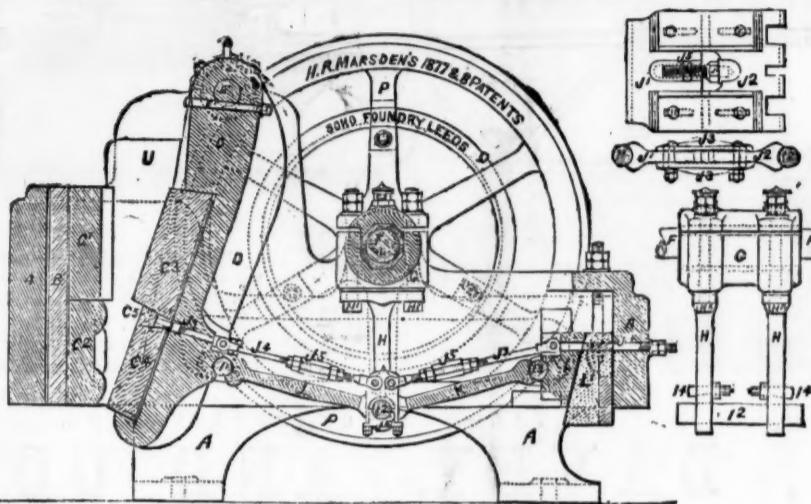
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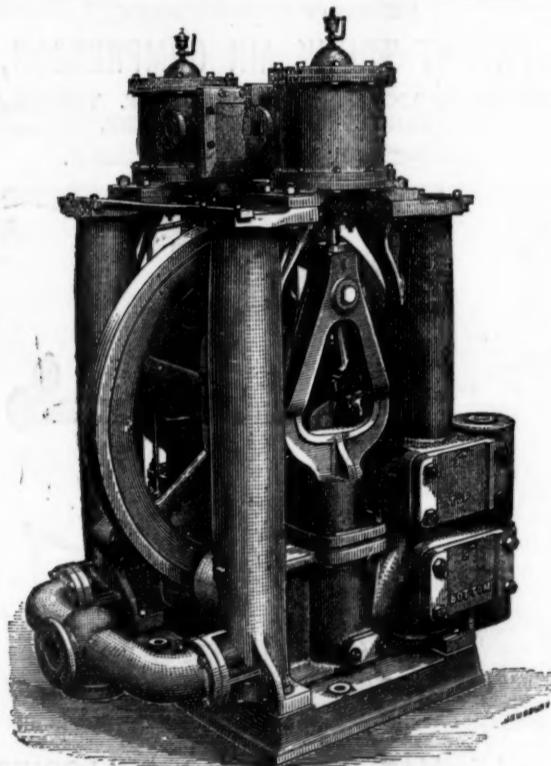
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